

APPENDIX C

CORE LOGS

APPENDIX C.1
FORMATTED CORE LOGS

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-01

Date: 10/16/02

Time: 1415

System: Cable Vibracore

Station Description: West bank of river.

Northing: 2319865.7

Easting: 2843535.9

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 576.2

Depth to Mudline (ft): 2.0

Penetration (ft): 11.0

Recovery (ft): 9.3

% Recovery: 85

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-01-CS-0-2 (0-2.4')	V. wet, (v. soft), brown to black, clayey SILT with fine to medium Sand to sandy clayey SILT with abundant petroleum sheen and odor and spots of NAPL.	1	V. wet, (v. soft), brown to black, clayey SILT with fine to medium Sand to sandy clayey SILT with abundant petroleum sheen and odor and spots of NAPL.	FW-WB-01-CS-0-2 (0-2')	A				
		2							
		3							
		4							
		5							
FW-WB-01-CS-5-7 (5.9-8.3')	Coal Tar/NAPL layer with Gravel.	6	Coal Tar/NAPL layer with Gravel.	FW-WB-01-CS-5-7 (5-7') (MS/MSD)	C				
		7							
		8							
FW-WB-01-CS-7-9.3 (8.3-11.0')	Same as 0 - 4.1' below mudline.	9	Moist, (soft), brown, clayey SILT with fine Sand and scattered organic fragments throughout; organics increase with depth; shell fragments increase with depth.	FW-WB-01-CS-7-9.3 (7-9.3')	C,B				
		10							
		11							
FW-WB-01-CS-11-13	BOB @ 11.0'	12	BOB @ 9.3'						
		13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.
 MS/MSD collected at FW-WB-01-CS-5-7



**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-02

Date: 10/16/02

Time: 1300

System: Cable Vibracore

Station Description: Center of River.

Northing: 2319857.5

Easting: 2843505.1

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 576.4

Depth to Mudline (ft): 1.6

Penetration (ft): 11.0

Recovery (ft): 8.9

% Recovery: 81

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-02-CS-0-2.9 (0-3.6')	V. wet, (v. soft), black, sandy SILT with Clay and petroleum sheen, odor, shell fragments and fine to medium organic debris. (ML) Not as much NAPL as WB-01 and WB-03. Horizon marked by a fine shell fragmented layer.	1	V. wet, (v. soft), black, sandy SILT with Clay and petroleum sheen, odor, shell fragments and fine to medium organic debris. (ML) Not as much NAPL as WB-01 and WB-03. Horizon marked by a fine shell fragmented layer.	FW-WB-02-CS-0-2.9 (0-2.9')	A				
		2							
		3							
		4							
FW-WB-02-CS-2.9-6 (3.6-7.4')	Wet, (V. soft to soft), brown/olive, clayey SILT with fine Sand and scattered organics/shell fragments. Clay increases with depth.	5	Wet, (V. soft to soft), brown/olive, clayey SILT with fine Sand and scattered organics/shell fragments. Clay increases with depth.	FW-WB-02-CS-2.9-6 (2.9-6')	B,C,GT				
		6							
		7							
		8							
FW-WB-02-CS-6-8.9 (7.4-11')		9	BOB @ 8.9'	FW-WB-02-CS-6-8.9 (6-8.9')	C				
		10							
		11							
		12							
	BOB @ 11.0'	13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals

G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners

* In-situ compaction based on linear compaction ratios.

CORING NOTES: Sheen observed while coring. Strong petroleum odor.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-02geo

Date: 10/22/02

Time: 1550

System: Cable vibracore

Station Description:

Northing: 2319857.5

Easting: 2843505.1

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 576.4

Depth to Mudline (ft): 1.5

Penetration (ft): 10.5

Recovery (ft): 9.2

% Recovery: 88

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
		1							
		2							
		3							
WB-02 3 - 5 (3.4-5.7')	Wet, (v. soft to soft), brown to olive, clayey SILT with fine Sand; scattered organics; shell fragments strong petroleum odor; NAPL present. Headspace ranged from 0.01' to 0.035'.	4	Wet, (v. soft to soft), brown to olive, clayey SILT with fine Sand; scattered organics; shell fragments; strong petroleum odor; NAPL present.	WB-02 3 - 5 (3-5')	UU,CO				
		5	Headspace ranged from 0.01' to 0.035'.						
		6							
		7	Wet, (v. soft to soft), brown to olive, clayey SILT with fine Sand; scattered organics; shell fragments; clay increases with depth.	WB-02 6 - 7.6 (6-7.6')	UU,CO				
WB-02 6 - 7.6 (6-7.6')	Wet, (v. soft to soft), brown to olive, clayey SILT with fine Sand; scattered organics; shell fragments clay increases with depth. Headspace ranged from 0' to 0.009'.	8	Headspace ranged from 0' to 0.009'.						
		9							
		10	BOB @ 9.2'						
BOB @ 10.5'		11							
		12							
		13							

NOTES: UU = UU Triaxial Shear Testing; CO = Consolidation Testing

* In-situ compaction based on linear compaction ratios.

Headspace measurements taken in tenths of a foot from the top of the sediment to the top of the aluminum pipe.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-03

Date: 10/16/02

Time: 1205

System: Cable Vibracore

Station Description: West side of river.

Northing: 2319863.3

Easting: 2843475.2

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 577.3

Depth to Mudline (ft): 0.7

Penetration (ft): 11.9

Recovery (ft): 11.2

% Recovery: 94

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-03-CS-0-1.2 (0-1.3')	V. wet, (v. soft), clayey SILT with fine Sand and organic debris and petroleum sheen and odor (high to moderate) and some NAPL.	1	V. wet, (v. soft), clayey SILT with fine Sand and organic debris and petroleum sheen and odor (high to moderate) and some NAPL.	FW-WB-03-CS-0-1.2 (0-1.2')	A				
FW-WB-03-CS-1.2-4 (1.3-4.2')	Wet to moist, (soft), brown, clayey SILT with fine Sand (ML). Higher organics in top 1 foot of section. (OH) Clay increasing with depth.	2	Wet to moist, (soft), brown, clayey SILT with fine Sand (ML). Higher organics in top 1 foot of section. (OH) Clay increasing with depth.	FW-WB-03-CS-1.2-4 (1.2-4') D	C,P				
		3							
		4							
		5							
FW-WB-03-CS-4-6 (4.2-6.4')		6		FW-WB-03-CS-4-6 (4-6')	A				
		7							
FW-WB-03-CS-6-9.5 (6.4-10.1')		8		FW-WB-03-CS-6-9.5 (6-9.5')	A				
		9							
		10							
FW-WB-03-CS-9.5-11.2 (10.1-11.9')	Wet, (loose), tan, silty fine SAND (SM).	11	Wet, (loose), tan, silty fine SAND (SM).	FW-WB-03-CS-9.5-11.2 (9.5-11.2')	B,C,G				
		12							
	BOB @ 11.9'	13	BOB @ 11.2'						

NOTES: A = Archive; B = Bioassay; C = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals

G = Grain Size; GT = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; P = PCB Congeners

* In-situ compaction based on linear compaction ratios.

D = A duplicate of FW-WB-03-CS-1.2-4 was collected and designated as FW-WB-52-CS-1.2-4.

It was sampled for chemistry analysis only.

CORING NOTES: Sheen observed during coring. Surface sediment appears to be crude oil.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-04

Date: 10/15/02

Time: 1553

System: Cable Vibracore

Station Description: North side of river.

Northing: 2320627.4

Easting: 2842911.2

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 577.1

Depth to Mudline (ft): 0.9

Penetration (ft): 11.3

Recovery (ft): 11.3

% Recovery: 100

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-04-CS-0-8 (0-8')	V. wet, (v. soft) black, clayey SILT with fine Sand and moderate to high petroleum odor and sheen. Piece of glass at 4'. Highly contaminated. #	1	V. wet, (v. soft) black, clayey SILT with fine Sand and moderate to high petroleum odor and sheen. Piece of glass at 4'. Highly contaminated. #	FW-WB-04-CS-0-8 (0-8')	C				
		2							
		3							
		4							
		5							
		6							
		7							
		8							
FW-WB-04-CS-8-9.2 (8-9.2')	Moist, (soft), clayey sandy (fine) SILT with scattered shell fragments throughout. (ML-SM)	9	Moist, (soft), clayey sandy (fine) SILT with scattered shell fragments throughout. (ML-SM)	FW-WB-04-CS-8-9.2 (8-9.2')	A				
FW-WB-04-CS-9.2-11.3 (9.2-11.3')	Wet, (loose), grey to tan, fine to medium SAND with Silt. 1-2 inch layer of wood debris/sticks on surface of sand.	10	Wet, (loose), grey to tan, fine to medium SAND with Silt. 1-2 inch layer of wood debris/sticks on surface of sand.	FW-WB-04-CS-9.2-11.3 (9.2-11.3')	C				
		11							
	BOB @ 11.3'	12	BOB @ 11.3'						
		13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals

G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners

* In-situ compaction based on linear compaction ratios.

Limited recovery of the upper 8 ft due to compaction or pile driving.

CORING NOTES: Tan sand in core catcher. Strong petroleum odor. Sheen created during coring.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-05

Date: 10/16/02

Time: 1045

System: Cable Vibracore

Station Description: Center of river.

Northing: 2320602.6

Easting: 2842892.4

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 576.7

Depth to Mudline (ft): 1.2

Penetration (ft): 10.6

Recovery (ft): 10.0

% Recovery: 94

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-05-CS-2-4.2 (2.1-4.5')	V. wet, (loose), black (with tan layers), silty fine to medium SAND (SM) with some coarser SAND and fine Gravels and petroleum sheen and odor and scattered vegetation. Coal tar (gravel size) observed in places with NAPL associated.	1	V. wet, (loose), black (with tan layers), silty fine to medium SAND (SM) with some coarse SAND and fine Gravels and petroleum sheen and odor and scattered vegetation. Coal tar (gravel size) observed in places with NAPL associated.	FW-WB-05-CS-2-4.2 (2-4.2')	A				
		2							
		3							
		4							
FW-WB-05-CS-4.2-7.5 (4.5-8.0')	Wet to moist, (soft) black to brown, clayey SILT (OH) with fine Sand and extensive petroleum sheen and odor. Some NAPL observed throughout section. Observed hair-like fibres in sediment that may be actual hair from sewage.	5	Wet to moist, (soft) black to brown, clayey SILT (OH) with fine Sand and extensive petroleum sheen and odor. Some NAPL observed throughout section. Observed hair-like fibres in sediment that may be actual hair from sewage.	FW-WB-05-CS-4.2-7.5 (4.2-7.5')	C,P				
		6							
		7							
		8							
FW-WB-05-CS-7.5-10 (8-10.6')	Moist, (soft), brown to olive, clayey SILT with fine Sand and fine organics throughout depth (OH). Zone of dark material (only color change) 1-2".	9	Zone of dark material (only color change) 1-2".	FW-WB-05-CS-7.5-10 (7.5-10')	B,C,G				
		10							
		11	BOB @ 10'						
	BOB @ 10.6'	12							
		13							

NOTES: A = Archive; B = Bioassay; C = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; GT = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; P = PCB Congeners
* In-situ compaction based on linear compaction ratios.

Bottom section of core had contamination on outside. Scraped this off best we could. Some compromise of sample may occur. (material does not appear to be contaminated.)



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-06

Date: 10/15/02

Time: 1631

System: Cable vibracore

Station Description: South side of river.

Northing: 2320565.4

Easting: 2842892.3

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 577.2

Depth to Mudline (ft): 0.8

Penetration (ft): 11.9

Recovery (ft): 11.9

% Recovery: 100

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
	POOR RECOVERY - MOST NOT RECOVERED V. wet, (v. soft), black, clayey SILT with Sand; heavy petroleum sheen and odor.	1	POOR RECOVERY - MOST NOT RECOVERED V. wet, (v. soft), black, clayey SILT with Sand; heavy petroleum sheen and odor.						
		2							
		3							
		4							
		5							
		6							
FW-WB-06-CS-6-7.8 (6-7.8')	V. wet, (loose), brown to gray, silty fine to medium SAND with Clay; extensive petroleum contamination with coal tar observed.	7	V. wet, (loose), brown to gray, silty fine to medium SAND with Clay; extensive petroleum contamination with coal tar observed.	FW-WB-06-CS-6-7.8 (6-7.8')	A				
	Wet, (loose), brown to gray, fine to medium SAND lense with Silt.	8	Wet, (loose), brown to gray, fine to medium SAND lense with Silt.						
FW-WB-06-CS-7.8-11.9 (7.8-11.9')	Moist, (soft), brown to olive, clayey SILT with fine Sand and trace of shell fragments and fine organics throughout (OH). (Native?) #	9	Moist, (soft), brown to olive, clayey SILT with fine Sand and trace of shell fragments and fine organics throughout (OH). (Native?) #	FW-WB-06-CS-7.8-11.9 (7.8-11.9')	A,C				
		10							
		11							
		12							
	BOB @ 11.9'	13	BOB @ 11.9'						

NOTES: A = Archive; B = Bioassay; C = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals

G = Grain Size; GT = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; P = PCB Congeners

* In-situ compaction based on linear compaction ratios.

Concerned about "draw down" from very contaminated material above.

CORING NOTES: 7.8 - 11.9 ft may be compromised due to pore waters from above material.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-07b

Date: 10/15/02

Time: 1213

System: Cable vibracore

Station Description: West end of reach #1. Second core at this location.

Northing: 2320632.8

Easting: 28441993.4

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 575.6

Depth to Mudline (ft): 2.4

Penetration (ft): 11.5

Recovery (ft): 9.8

% Recovery: 85

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-07-CS-0-2 (0-2.3')	V. wet, (v. soft), brown, clayey SILT (OH) with trace of shell fragments (freshwater clam) to a depth of 3.5'; fragmented cattail and fragmented roots; sand increasing with depth.	1	V. wet, (v. soft), brown, clayey SILT (OH) with trace of shell fragments (freshwater clam) to a depth of 3.5'; fragmented cattail and fragmented roots; sand increasing with depth.	FW-WB-07-CS-0-2 (0-2')	A				
		2							
FW-WB-07-CS-2-4 (2.3-4.7')		3		FW-WB-07-CS-2-4 (2-4')	B,C,GT P				
		4							
FW-WB-07-CS-4-7.1 (4.7-8.3')		5		FW-WB-07-CS-4-7.1 (4-7.1')	A				
		6							
		7							
		8							
FW-WB-07-CS-7.1-9.4 (8.3-11.0')	Moist to wet, (loose), tan to brown, silty fine SAND with Clay (SM). (Native)	9	Same as above but tan, silty fine SAND lenses at approximately 8 and 9 feet (SM/SW). Each lense is approximately 2 inches.	FW-WB-07-CS-7.1-9.4 (7.1-9.4')	B,C,GT				
		10	Clayey SILT with Sand (Native)						
	Same as above but tan, silty fine SAND lenses at approximately 8 and 9 feet (SM/SW). Each lense is approximately 2 inches.	11	BOB @ 9.8'	FW-WB-07-CS-9.4-9.8 (9.4-9.8')	A				
FW-WB-07-CS-9.4-9.8 (11-11.5')		12							
	BOB @ 11.5'	13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.

CORING NOTES: Lost 1.2 ft from bottom.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-08

Date: 10/15/02

Time: 1247

System: Cable vibracore

Station Description: West end of reach #7 - center core.

Northing: 2320603.7

Easting: 2841996.2

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 576.6

Depth to Mudline (ft): 1.4

Penetration (ft): 11.4

Recovery (ft): 9.9

% Recovery: 87

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-08-CS-0-2 (0-2.3')	V. wet, (v. soft to soft), brown to black, clayey SILT with fine Sand and root fragments to a depth of 2' (OH). Fine sand increasing with depth.	1	V. wet, (v. soft to soft), brown to black, clayey SILT with fine Sand and root fragments to a depth of 2' (OH). Fine sand increasing with depth.	FW-WB-08-CS-0-2 (0-2')	B,C,GT				
		2							
FW-WB-08-CS-2-4 (2.3-4.6)		3		FW-WB-08-CS-2-4 (2-4')	A				
		4							
FW-WB-08-CS-4-7.6 (4.6-8.7)		5		FW-WB-08-CS-4-7.6 (4-7.6')	C,GT				
		6							
		7							
		8							
FW-WB-08-CS-7.6-9.9 (8.7-11.4')	Moist, (soft), clayey sandy (fine) SILT (ML) with trace fine shell fragments.	9	Moist, (soft), clayey sandy (fine) SILT (ML) with trace fine shell fragments.	FW-WB-08-CS-7.6-9.9 (7.6-9.9')	A				
		10							
		11							
	BOB @ 11.4'	12	BOB @ 9.9'						
		13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.

CORING NOTES: Lost 0.9 ft out the bottom.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-09

Date: 10/15/02

Time: 1419

System: Cable vibracore

Station Description: End of reach #1 - south bank.

Northing: 2320590.6

Easting: 2842016.7

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 577.4

Depth to Mudline (ft): 0.6

Penetration (ft): 11.5

Recovery (ft): 10.9

% Recovery: 95

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-09-CS-0-2 (0-2.1')	V. wet, (soft), black, clayey SILT with fine SAND and moderate petroleum odor and sheen.	1	V. wet, (soft), black, clayey SILT with fine SAND and moderate petroleum odor and sheen.	FW-WB-09-CS-0-2 (0-2')	A				
	Wet, (soft), brown, clayey SILT with fine organics and shell fragments throughout (OH); fine sand increasing with depth; fine roots and other organics decreasing with depth.	2	Wet, (soft), brown, clayey SILT with fine organics and shell fragments throughout (OH); fine sand increasing with depth; fine roots and other organics decreasing with depth.						
FW-WB-09-CS-2-4 (2.1-4.2')		3		FW-WB-09-CS-2-4 (2-4')	A				
		4							
FW-WB-09-CS-4-6 (4.2-6.4')	Moist, (soft), brown, clayey SILT with fine Sand (ML).	5	Moist, (soft), brown, clayey SILT with fine Sand (ML).	FW-WB-09-CS-4-6 (4-6')	C				
		6							
FW-WB-09-CS-6-8 (6.4-8.5')		7		FW-WB-09-CS-6-8 (6-8')	A				
		8							
FW-WB-09-CS-8-10 (8.5-10.6')		9		FW-WB-09-CS-8-10 (8-10')	C				
		10							
FW-WB-09-CS-10-10.9 (10-10.9')	Moist, (soft to medium stiff), brown, clayey sandy SILT (ML).	11	Moist, (soft to medium stiff), brown, clayey sandy SILT (ML).	FW-WB-09-CS-10-10.9 (10-10.9')	A				
	BOB @ 11.5'	12	BOB @ 10.9'						
		13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.

CORING NOTES: Sheen observed during coring.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-09geo

Date: 10/22/02

Time: 1235

System: Cable vibracore

Station Description:

Northing: 2320590.6

Easting: 2842016.7

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 577.4

Depth to Mudline (ft): 0.7

Penetration (ft): 11.1

Recovery (ft): 10.3

% Recovery: 93

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
		1							
		2							
		3							
		4							
WB-09 3.8-5.5 (4.1-5.9')	Wet, (soft), brown clayey SILT with fine to medium Sand.	5	Wet, (soft), brown clayey SILT with fine to medium Sand.	WB-09 3.8-5.5 (3.8-5.5')	UU,CO				
	Wet, (soft), brown, clayey, sandy SILT with fine to medium Sand	6	Wet, (soft), brown, clayey, sandy SILT with fine to medium Sand Headspace ranged from 0.030' to 0.035'						
	Headspace ranged from 0.030' to 0.035'	7							
		8							
WB-09 7.8-9.5 (8.4-10.3')	Moist, (soft), brown clayey SILT with fine Sand.	9	Moist, (soft), brown clayey SILT with fine Sand.	WB-09 7.8-9.5 (7.8-9.5')	UU,CO				
	Headspace ranged from 0.0' to 0.01' <u>above</u> aluminum tube.	10	Headspace ranged from 0.0' to 0.01' <u>above</u> aluminum tube.						
		11	BOB @ 10.3'						
	BOB @ 10.3'	12							
		13							

NOTES: UU = UU Triaxial Shear Testing; CO = Consolidation Testing

* In-situ compaction based on linear compaction ratios.

Headspace measurements taken in tenths of a foot from the top of the sediment to the top of the aluminum pipe.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-10

Date: 10/17/02

Time: 1010

System: Cable vibracore

Station Description: North side of river.

Northing: 2319706.9

Easting: 2840998.5

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 579.3

Depth to Mudline (ft): 0.6

Penetration (ft): 11.4

Recovery (ft): 9.6

% Recovery: 84

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-10-CS-0-3.2 (0-3.8')	V. wet, (v. soft) black, sandy, clayey, SILT (OH) with strong petroleum sheen and odor and fine organics (including human hair).	1	V. wet, (v. soft) black, sandy, clayey, SILT (OH) with strong petroleum sheen and odor and fine organics (including human hair).	FW-WB-10-CS-0-3.2 (0-3.2')	B,C,GT P				
		2							
		3							
		4							
FW-WB-10-CS-3.2-6 (3.8-7.1')	Wet to moist, (soft), brown to olive, clayey SILT with fine Sand and scattered fine organics and shell fragments (OH/ML).	5	Wet to moist, (soft), brown to olive, clayey SILT with fine Sand and scattered fine organics and shell fragments (OH/ML).	FW-WB-10-CS-3.2-6 (3.2-6')	B,C,GT				
		6							
		7							
		8							
FW-WB-10-CS-6-8 (7.1-9.5')		9		FW-WB-10-CS-6-8 (6-8')	A				
		10			A				
		11							
		12							
FW-WB-10-CS-8-9.6 (9.5-11.4')	BOB @ 11.4'	13	BOB @ 9.6'						

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-11

Date: 10/17/02

Time: 1055

System: Cable vibracore

Station Description: Center of river.

Northing: 2319668.9

Easting: 2841001.5

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 577.6

Depth to Mudline (ft): 2.3

Penetration (ft): 11.4

Recovery (ft): 9.4

% Recovery: 82

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay	
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)						
FW-WB-11-CS-0-4 (0-4.8')	V. wet, (v. soft), black, organic, clayey, SILT with fine Sand (OH); moderate to heavy petroleum sheen and odor; hair-like fibers; green vegetation in top 1'; dead dragon fly (approximately 2 cm long) at 1'.	1	V. wet, (v. soft), black, organic, clayey, SILT with fine Sand (OH); moderate to heavy petroleum sheen and odor; hair-like fibers; green vegetation in top 1'; dead dragon fly (approximately 2 cm long) at 1'.	FW-WB-11-CS-0-4 (0-4')	C					
		2								
		3								
		4								
FW-WB-11-CS-4-6 (4.8-7.3')	Wet, (soft), olive to brown, clayey SILT with fine Sand and fine organics; scattered shell fragments. (Native?)	5	Wet, (soft), olive to brown, clayey SILT with fine Sand and fine organics; scattered shell fragments. (Native?)	FW-WB-11-CS-4-6 (4-6)	C					
		6								
7		FW-WB-11-CS-6-8 (6-8)		A						
8										
FW-WB-11-CS-6-8 (7.3-9.7')		9		FW-WB-11-CS-8-9.4 (8-9.4')	A					
		10								
FW-WB-11-CS-8-9.4 (9.7-11.4')		Scattered vegetation and wood chips at base of core.		11	BOB @ 9.4'					
				12						
BOB @ 11.4'				13						

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.

CORING NOTES: Coring created a petroleum sheen on the water surface.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-12

Date: 10/17/02

Time: 1120

System: Cable vibracore

Station Description: South side of river.

Northing: 2319628.9

Easting: 2841004.3

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 578.8

Depth to Mudline (ft): 1.1

Penetration (ft): 10.9

Recovery (ft): 9.4

% Recovery: 86

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay	
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)						
FW-WB-12-CS-0-4 (0-4.6')	V. wet, (v. soft), black, clayey SILT with fine Sand and organics throughout (including human hair); moderate/extensive petroleum sheen/NAPL and odor.	1	V. wet, (v. soft), black, clayey SILT with fine Sand and organics throughout (including human hair); moderate/extensive petroleum sheen/NAPL and odor.	FW-WB-12-CS-0-4 (0-4')	A					
		2								
		3								
		4								
FW-WB-12-CS-4-6 (4.6-7')	Wet, (soft), tan to brown, clayey SILT with Sand (ML) alternating with wet, (loose), tan, silty fine to medium SAND (SM). (Native)	5	Wet, (soft), tan to brown, clayey SILT with Sand (ML) alternating with wet, (loose), tan, silty fine to medium SAND (SM). (Native)	FW-WB-12-CS-4-6 (4-6')	C					
		6								
		FW-WB-12-CS-6-8.5 (7-9.9')		1-2 inch shell fragment layers at 7 ft.	7	1-2 inch shell fragment layers at 7 ft.	FW-WB-12-CS-6-8.5 (6-8.5')	B,C		
8										
9	Wet, (loose), tan, fine to medium SAND (SW). (Native)		FW-WB-12-CS-8.5-9.4 (8.5-9.4')		A					
FW-WB-12-CS-8.5-9.4 (9.9-10.9')	Wet, (loose), tan, fine to medium SAND (SW). (Native)	11	BOB @ 9.4'							
		12								
	BOB @ 10.9	13								

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.

CORING NOTES: Refusal encountered at 10.9 ft.
 Petroleum sheen created from coring.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-12geo

Date: 10/22/02

Time: 1015

System: Cable vibracore

Station Description: Geotechnical core - south side of river.

Northing: 2319636.3

Easting: 2840999.5

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 578.8

Depth to Mudline (ft): 1.5

Penetration (ft): 10.4

Recovery (ft): 8.6

% Recovery: 83

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
		1							
		2							
		3							
		4	Wet, (loose), dark brown to black, silty SAND with trace organics; slight petroleum odor.	WB-12 3.5-5 (3.5-5')	UU,CO				
WB-12 3.5-5 (4.2-6.1')	Wet, (loose), dark brown to black, silty SAND with trace organics; slight petroleum odor.	5							
		6	Wet, (soft), dark brown, clayey, sandy SILT with organics (peat).	WB-12 5-6.5 (5-6.5')	UU,CO				
WB-12 5-6.5 (6.1-7.9')	Wet, (soft), dark brown, clayey, sandy SILT with organics (peat).	7	Wet, (loose), brown, silty SAND (at top).	WB-12 6.5-7.8 (6.5-7.8')	DS				
		8	Wet, (loose), tan, fine to medium SAND (at base).						
WB-12 6.5-7.8 (7.9-9.4')	Wet, (loose), brown, silty SAND (at top).	9	BOB @ 8.6'						
	Wet, (loose), tan, fine to medium SAND (at base).	10							
		11							
	BOB @ 10.4'	12							
		13							

NOTES: UU = UU Triaxial Shear testing; CO = Consolidation Testing; DS = Direct Shear Testing.

* In-situ compaction based on linear compaction ratios.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-13

Date: 10/17/02

Time: 1230

System: Cable vibracore

Station Description:

Northing: 2319901.1

Easting: 2839937.2

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 579.2

Depth to Mudline (ft): 0.7

Penetration (ft): 11.4

Recovery (ft): 9.6

% Recovery: 84

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-13-CS-0-2.1 (0-2.5)	Wet, (v. soft), black, clayey SILT with fine Sand; strong petroleum odor and abundant sheen.	1	Wet, (v. soft), black, clayey SILT with fine Sand; strong petroleum odor and abundant sheen.	FW-WB-13-CS-0-2.1 (0-2.1')	A				
		2							
FW-WB-13-CS-2.1-4 (2.5-4.8')	Clay increases with depth; NAPL globules observed throughout.	3	Clay increases with depth; NAPL globules observed throughout.	FW-WB-13-CS-2.1-4 (2.1-4')	A				
		4							
FW-WB-13-CS-4-6.1 (4.8-7.3')		5		FW-WB-13-CS-4-6.1 (4-6.1')	C,GT				
		6							
		7	Petroleum sheen ends. Wet to moist, (soft), olive brown, clayey SILT with fine Sand (ML); scattered shell fragments. (Native?)	FW-WB-13-CS-6.1-9.6 (6.1-9.6') D	B,C,GT				
		8							
FW-WB-13-CS-6.1-9.6 (7.3-11.4')	Petroleum sheen ends. Wet to moist, (soft), olive brown, clayey SILT with fine Sand (ML); scattered shell fragments. (Native?)	9							
		10							
		11	BOB @ 9.6'						
		12							
	BOB @ 11.4'	13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.
 D = A duplicate was collected for FW-WB-13-CS-6.1-9.6 and designated FW-WB-60-CS-6.1-9.6.
 It was analyzed for Geotech only.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-14

Date: 10/17/02

Time: 1320

System: Cable vibracore

Station Description:

Northing: 2319862.97

Easting: 2839916.1

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 578.3

Depth to Mudline (ft): 1.6

Penetration (ft): 11.5

Recovery (ft): 9.7

% Recovery: 84

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-14-CS-0-2 (0-2.4')	V. wet, (v. soft), black, clayey SILT with SAND and extensive petroleum contamination.	1	V. wet, (v. soft), black, clayey SILT with SAND and extensive petroleum contamination.	FW-WB-14-CS-0-2 (0-2')	B,C				
		2							
FW-WB-14-CS-2-3.8 (2.4-4.6')		3		FW-WB-14-CS-2-3.8 (2-3.8')	A				
		4							
FW-WB-14-CS-3.8-6.2 (4.6-7.4')	Texture change, v. soft to soft.	5	Texture change, v. soft to soft.	FW-WB-14-CS-3.8-6.2 (3.8-6.2')	A				
		6							
			7	Petroleum sheen ends. Wet to moist, (soft), olive brown, clayey SILT with fine SAND and scattered shell fragments and fine organics (ML). (Native?)	FW-WB-14-CS-6.2-9.7 (6.2-9.7')	C			
FW-WB-14-CS-6.2-9.7 (7.4-11.5')	8	BOB @ 9.7'							
	9								
	10								
	11								
BOB @ 11.5'		12							
		13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-15

Date: 10/17/02

Time: 1200

System: Cable vibracore

Station Description:

Northing: 2839890.2

Easting: 2319824.4

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 579.2

Depth to Mudline (ft): 0.7

Penetration (ft): 11.4

Recovery (ft): 9.4

% Recovery: 82

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-15-CS-0-0.9 (0-1.1')	V. wet, (v. soft), black, clayey SILT with fine Sand and moderate petroleum sheen and odor.	1	V. wet, (v. soft), black, clayey SILT with fine Sand and moderate petroleum sheen and odor.	FW-WB-15-CS-0-0.9 (0-0.9')	A				
FW-WB-15-CS-0.9-3 (1.1-3.6')	V. wet to wet to moist, (soft), olive brown, clayey SILT with fine Sand and scattered shell fragments and fine organics (ML).	2	V. wet to wet to moist, (soft), olive brown, clayey SILT with fine Sand and scattered shell fragments and fine organics (ML).	FW-WB-15-CS-0.9-3 (0.9-3')	C,P				
		3							
		4							
FW-WB-15-CS-3-5 (3.6-6.0')	Shell lense.	5	Shell lense.	FW-WB-15-CS-3-5 (3-5')	C				
6									
7									
FW-WB-15-CS-5-7 (6.0-8.4')	Shell lense.	8	Shell lense.	FW-WB-15-CS-5-7 (5-7')	A				
9									
10									
FW-WB-15-CS-7-9.4 (8.4-11.4')		11	BOB @ 9.4'						
		12							
		13							
	BOB @ 11.4'								

NOTES: A = Archive; B = Bioassay; C = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals

G = Grain Size; GT = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; P = PCB Congeners

* In-situ compaction based on linear compaction ratios.

CORING NOTES: Coring created a petroleum sheen.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-16

Date: 10/18/02

Time: 0958

System: Cable vibracore

Station Description: Edge of marsh - north side of river.

Northing: 2320828.25

Easting: 2838305.11

Datum: NAD 83 Indiana West

Mudline Elev. (ft):

Depth to Mudline (ft): 0.0

Penetration (ft): 10.7

Recovery (ft): 8.0

% Recovery: 75

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-16-CS-0-1.9 (0-2.5')	V. wet, (v. loose), black, silty fine to medium SAND with extensive petroleum sheen and odor; misc organics.	1	V. wet, (v. loose), black, silty fine to medium SAND with extensive petroleum sheen and odor; misc organics.	FW-WB-16-CS-0-1.9 (0-1.9')	A				
		2							
		FW-WB-16-CS-1.9-5.2 (2.5-6.8')	V. wet, (v. soft), black, clayey, sandy SILT with extensive petroleum sheen and odor; misc organics; NAPL globules with coal tar type material (gravels).	3	V. wet, (v. soft), black, clayey, sandy SILT with extensive petroleum sheen and odor; misc organics; NAPL globules with coal tar type material (gravels).	FW-WB-16-CS-1.9-5.2 (1.9-5.2') D	B,C,GT, P		
4									
5									
6									
7	End of visible petroleum.			FW-WB-16-CS-5.2-8.0 (5.2-8')	C				
8	Wet to moist, (soft), olive brown, clayey SILT with fine Sand (ML/OH); Peaty; extensive shell fragments/fine organics (Native).								
9	End of visible petroleum.								
FW-WB-16-CS-5.2-8.0 (6.8-10.7')	Wet to moist, (soft), olive brown, clayey SILT with fine Sand (ML/OH); Peaty; extensive shell fragments/fine organics (Native).	10	BOB @ 8.0'						
		11							
		12							
		13							
	BOB @ 10.7'								

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals

G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners

* In-situ compaction based on linear compaction ratios.

D = A duplicate was collected for FW-WB-16-CS-1.9-5.2 and designated FW-WB-70-CS-1.9-5.2.

It was analyzed for PCB Congeners only.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-17

Date: 10/18/02

Time: 1125

System: Cable Vibracore

Station Description: Middle of river.

Northing: 2320801.45

Easting: 2838317.62

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 579.2

Depth to Mudline (ft): 0.4

Penetration (ft): 10.4

Recovery (ft): 8.3

% Recovery: 80

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-17-CS-0-3.8 (0-4.8')	V. wet, (v. loose to loose), black, silty fine to medium SAND with abundant organics; petroleum sheen and odor; misc. organics throughout. 2-3 large gravels in top 1 ft.	1	V. wet, (v. loose to loose), black, silty fine to medium SAND with abundant organics; petroleum sheen and odor; misc. organics throughout. 2-3 large gravels in top 1 ft.	FW-WB-17-CS-0-3.8 (0-3.8')	B,C,G	1	91	8	1
		2							
		3							
		4							
		5							
FW-WB-17-CS-3.8-5.6 (4.8-7')	Wet, (v. soft to soft), black, clayey, sandy SILT with abundant organics, petroleum sheen and odor.	6	Wet, (v. soft to soft), black, clayey, sandy SILT with abundant organics, petroleum sheen and odor.	FW-WB-17-CS-3.8-5.6 (3.8-5.6')	A				
		7							
		8							
FW-WB-17-CS-5.6-8.3 (7-10.4')	Wet to moist, (soft), olive brown, clayey SILT with fine Sand and trace shell fragments (ML/OH); organics increase with depth; shell fragments increase at bottom. (Native?)	9	Wet to moist, (soft), olive brown, clayey SILT with fine Sand and trace shell fragments (ML/OH); organics increase with depth; shell fragments increase at bottom. (Native?)	FW-WB-17-CS-5.6-8.3 (5.6-8.3')	C				
		10							
		11							
		12							
		13							
BOB @ 10.4			BOB @ 8.3'						

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-18

Date: 10/18/02

Time: 1155

System: Cable vibracore

Station Description: Very shallow water - south side of river.

Northing: 2320776.28

Easting: 2838311.74

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 579.3

Depth to Mudline (ft): 0.3

Penetration (ft): 10.8

Recovery (ft): 9.3

% Recovery: 86

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay	
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)						
FW-WB-18-CS-0-3.7 (0-4.3')	V. wet, (v. loose), black, silty, fine to medium SAND with abundant misc. organics; petroleum sheen and odor; woody debris on surface; sewage related materials.	1	V. wet, (v. loose), black, silty, fine to medium SAND with abundant misc. organics; petroleum sheen and odor; woody debris on surface; sewage related materials.	FW-WB-18-CS-0-3.7 (0-3.7')	A					
		2								
		3								
		FW-WB-18-CS-3.7-6.5 (4.3-7.5')	V. wet to wet, (soft), black, clayey SILT with fine Sand; abundant misc. organics (OH).	4	V. wet to wet, (soft), black, clayey SILT with fine Sand; abundant misc. organics (OH).	FW-WB-18-CS-3.7-6.5 (3.7-6.5')	C			
5										
6	Tan/brown sand lense (1-2 inches).									
	Tan/brown sand lense (1-2 inches).			Same as 3.7 - 5.1 ft below mudline.						
				Peat layer towards bottom of interval.						
	Same as 4.3 - 5.9 ft below mudline.		7	Wet to moist, (loose), tan, fine to medium SAND with trace Silt and scattered shell fragments. (Native)	FW-WB-18-CS-6.5-9.3 (6.5-9.3')	B,C,G				
	Peat layer towards bottom of interval.									
FW-WB-18-CS-6.5-9.3 (7.5-10.8')	Wet to moist, (loose), tan, fine to medium SAND with trace Silt and scattered shell fragments. (Native)	8								
		9								
		10	BOB @ 9.3'							
11										
12										
	BOB @ 10.8'	13								

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.
 Sand in base of core; compaction likely occurred in upper core, therefore, recovers core length used in evaluation.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-18geo

Date: 10/21/02

Time: 1630

System: Cable vibracore

Station Description:

Northing: 2320776.28

Easting: 2838311.74

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 579.3

Depth to Mudline (ft): NA

Penetration (ft): 10.8

Recovery (ft): 9.8

% Recovery: 91

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
		1							
		2							
		3							
		4							
		5	V. wet, (soft), dark brown to black, clayey SILT with fine Sand; abundant organics; trace shell fragments.	WB-18 4.5-6 (4.5-6')	UU,CO				
WB-18 4.5-6 (4.9-6.6')	V. wet, (soft), dark brown to black, clayey SILT with fine Sand; abundant organics; trace shell fragments.	6	Wet, loose, brown SILT and SAND.						
	Wet, loose, brown SILT and SAND.	7	Headspace ranged from 0.02' to 0.015'.						
	Headspace ranged from 0.02' to 0.015'.	8	Wet, (loose), same as above	WB-18 7.5-9 (7.5-9')	DS				
WB-18 7.5-9 (8.3-9.9')	Wet, (loose), same as above	9	Wet to moist, (loose), tan, fine to medium SAND with trace Silt; abundant shell frags. (Native) (Native)						
	Wet to moist, (loose), tan, fine to medium SAND with trace Silt; abundant shell frags. (Native)	10							
		11	BOB @ 9.8'						
	BOB @ 10.8'	12							
		13							

NOTES: DS = Direct Shear Testing; UU = UU Triaxial Shear Testing; CO = Consolidation Testing.

* In-situ compaction based on linear compaction ratios.

Headspace measurements taken in tenths of a foot from the top of the sediment to the top of the aluminum pipe.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-19

Date: 10/18/02

Time: 1430

System: Cable vibracore

Station Description: North side of river.

Northing: 2320927.9

Easting: 2837530.4

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 579.0

Depth to Mudline (ft): 0.6

Penetration (ft): 11.0

Recovery (ft): 8.8

% Recovery: 80

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-19-CS-0-2 (0-2.5')	V. wet, (v. soft), black, clayey, sandy SILT with organic debris; slight petroleum sheen and odor; large piece of glass.	1	V. wet, (v. soft), black, clayey, sandy SILT with organic debris; slight petroleum sheen and odor; large piece of glass.	FW-WB-19-CS-0-2 (0-2')	B,C				
		2	Wet to moist, (v. soft to soft), olive brown, clayey SILT with fine Sand and fine organics throughout sample; trace shell fragments (ML). (Native?)						
FW-WB-19-CS-2-4 (2.5-5')	Wet to moist, (v. soft to soft), olive brown, clayey SILT with fine Sand and fine organics throughout sample; trace shell fragments (ML). (Native?)	3	BOB @ 8.8'	FW-WB-19-CS-2-4 (2-4')	C				
		4							
		5		FW-WB-19-CS-4-6 (4-6')	A				
FW-WB-19-CS-4-6 (5-7.5')		6							
		7							
		8							
FW-WB-19-CS-6-8.8 (7.5-11')		9		FW-WB-19-CS-6-8.8 (6-8.8')	A				
		10							
		11							
	BOB @ 11.0'	12							
		13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals

G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners

* In-situ compaction based on linear compaction ratios.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-20

Date: 11/18/02

Time: 1501

System: Cable vibracore

Station Description:

Northing: 2320893.3

Easting: 2837521.9

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 579.0

Depth to Mudline (ft): 0.7

Penetration (ft): 10.8

Recovery (ft): 8.8

% Recovery: 81

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-20-CS-0-2.8 (0-3.4')	Wet, (loose), black, clayey, silty SAND (SM) with abundant organics throughout; slight to moderate sheen.	1	Wet, (loose), black, clayey, silty SAND (SM) with abundant organics throughout; slight to moderate sheen.	FW-WB-20-CS-0-2.8 (0-2.8')	A				
		2							
		3							
FW-WB-20-CS-2.8-5.5 (3.4-6.8')	Wet, (loose), black, clayey, sandy SILT (ML); strong petroleum odor at base of interval.	4	Wet, (loose), black, clayey, sandy SILT (ML); strong petroleum odor at base of interval.	FW-WB-20-CS-2.8-5.5 (2.8-5.5')	C,GT				
		5							
		6							
FW-WB-20-CS-5.5-8.8 (6.8-10.8')	Wet, (v. soft to soft), brown to olive brown clayey SILT with fine Sand and organics (ML/OH). Peat at 7.6 and 8.4 ft below mudline.	7	Wet, (v. soft to soft), brown to olive brown clayey SILT with fine Sand and organics (ML/OH). Peat at 6.2 and 6.8 ft below mudline.	FW-WB-20-CS-5.5-8.8 (5.5-8.8')	B,C				
		8							
		9							
		10							
		11							
	BOB @ 10.8'	12	BOB @ 8.8'						
		13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals

G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners

* In-situ compaction based on linear compaction ratios.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-21

Date: 10/18/02

Time: 1545

System: Cable vibracore

Station Description: South side of river.

Northing: 2320852.93

Easting: 2837512.13

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 578.9

Depth to Mudline (ft): 0.8

Penetration (ft): 11

Recovery (ft): 8.7

% Recovery: 79

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay						
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)											
FW-WB-21-CS-0-3.5 (0-4.7')	V. wet, (v. soft), black clayey, sandy (fine to medium) SILT with moderate petroleum sheen and odor; misc. organics throughout.	1	V. wet, (v. soft), black clayey, sandy (fine to medium) SILT with moderate petroleum sheen and odor; misc. organics throughout.	FW-WB-21-CS-0-3.5 (0-3.5') (MS/MSD)	C,G,P										
		2													
		3								Peat observed; organics increased at 2-3 ft below mudline.					
		4	V. wet to wet, (v. soft to soft), brown to olive brown, clayey SILT with fine sand and organics (ML/OH); organics increase with depth.	FW-WB-21-CS-3.5-6 (3.5-6')	B,C,G										
		5								Tan sand lense at 4.6 ft below mudline.					
		6								Tan sand lense at 5.0 ft below mudline.					
FW-WB-21-CS-3.5-6 (4.7-8')	V. wet to wet, (v. soft to soft), brown to olive brown, clayey SILT with fine sand and organics (ML/OH); organics increase with depth.	7	Shell hash at 5 - 6 ft below mudline.	FW-WB-21-CS-6-8.2 (6-8.2')	A										
		8													
		9								BOB @ 8.2'					
		10													
11	Peat/wood at bottom of core (PT).														
FW-WB-21-CS-6-8.2 (8-11')	Peat/wood at bottom of core (PT).	12													
		13													
	BOB @ 11.0'														

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.
 MS/MSD collected at FW-WB-21-CS-0-3.5 and analyzed for PCB Congeners.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-22

Date: 10/19/02

Time: 1404

System: Cable vibracore

Station Description:

Northing: 2321153.41

Easting: 2836764.6

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 578.5

Depth to Mudline (ft): 1.2

Penetration (ft): 10.9

Recovery (ft): 8.5

% Recovery: 78

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-22-CS-0-1.9 (0-2.4')	V. wet, (v. soft), black, clayey, sandy SILT with abundant misc. organics; slight petroleum sheen and moderate petroleum odor.	1	V. wet, (v. soft), black, clayey, sandy SILT with abundant misc. organics; slight petroleum sheen and moderate petroleum odor.	FW-WB-22-CS-0-1.9 (0-1.9')	A				
		2							
FW-WB-22-CS-1.9-3.6 (2.4-4.6')	Consistency change. Sand decreases and Clay increases. Still have petroleum sheen and odor.	3	Consistency change. Sand decreases and Clay increases. Still have petroleum sheen and odor.	FW-WB-22-CS-1.9-3.6 (1.9-3.6')	A				
		4							
FW-WB-22-CS-3.6-6 (4.6-7.7')	Wet to moist, (soft), brown to olive brown, clayey SILT with fine Sand and scattered shell fragments (towards bottom); organic material (Peat) towards bottom (ML/OH).	5	Wet to moist, (soft), brown to olive brown, clayey SILT with fine Sand and scattered shell fragments (towards bottom); organic material (Peat) towards bottom (ML/OH).	FW-WB-22-CS-3.6-6 (3.6-6')	B,C,G				
		6							
		7		FW-WB-22-CS-6-8.2 (6-8.2') D (MS/MSD)	C,G				
		8							
FW-WB-22-CS-6-8.2 (7.7-10.5')	Wet, (loose), tan, F-M SAND with Silt and scattered to moderate shell fragments. (Native)	9	Wet, (loose), tan, F-M SAND with Silt and scattered to moderate shell fragments. (Native)						
		10							
		11							
	Wet, (loose), tan, F-M SAND with Silt and scattered to moderate shell fragments. (Native)	11	BOB @ 8.5'						
	BOB @ 10.9	12							
		13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.
 D = A duplicate was collected at FW-WB-22-CS-6-8.2 and designated FW-WB-61-CS-6-8.2, analyzed for grain size.
 D = A duplicate of FW-WB-22-CS-6-8.2 and designated FW-WB-54-CS-6-8.2 was analyzed for chemistry.
 MS/MSD was collected at FW-WB-22-CS-6-8.2.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-23

Date: 10/19/02

Time: 1326

System: Cable vibracore

Station Description:

Northing: 2321132.03

Easting: 2836767.8

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 578.6

Depth to Mudline (ft): 1.1

Penetration (ft): 11.0

Recovery (ft): 8.0

% Recovery: 72

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-23-CS-0-2.7 (0-3.7')	V. wet, (v. soft), black, sandy, clayey SILT with abundant misc. organics; slight to moderate petroleum sheen and odor.	1	V. wet, (v. soft), black, sandy, clayey SILT with abundant misc. organics; slight to moderate petroleum sheen and odor.	FW-WB-23-CS-0-2.7 (0-2.7')	C,GT,P				
		2							
		3							
		4							
FW-WB-23-CS-2.7-4.3 (3.7-5.9')	Texture change, less sewage related materials.	5	Texture change, less sewage related materials.	FW-WB-23-CS-2.7-4.3 (2.7-4.3')	A				
		6							
		7							
FW-WB-23-CS-4.3-6.5 (5.9-9')	Moist to damp, (m. stiff to stiff), gray to tan, silty CLAY with fine Sand (CL); peat zones. (Native) Tan sand lenses at 5.6 ft below mudline.	8	Moist to damp, (m. stiff to stiff), gray to tan, silty CLAY with fine Sand (CL); peat zones. (Native) Tan sand lenses at 5.6 ft below mudline.	FW-WB-23-CS-4.3-6.5 (4.3-6.5')	C,G				
		9							
		10							
		11							
FW-WB-23-CS-6.5-7.5 (9-10.4')	Sandy, silty CLAY. Tan sand lenses at 7.7 ft below mudline.	12	Sandy, silty CLAY. Tan sand lenses at 7.7 ft below mudline.	FW-WB-23-CS-6.5-7.5 (6.5-7.5')	A				
		13							
		14							
	Back to Silty CLAY with Sand. Piece of bottle and gravel at 7.5 ft below mudline. #	15	Back to Silty CLAY with Sand. Piece of bottle and gravel at 7.5 ft below mudline. #						
		16							
	BOB @ 11.0'	17	BOB @ 11.0'						
		18							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals

G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners

* In-situ compaction based on linear compaction ratios.

Material compacted in upper layers. Sand at bottom.

Piece of bottle may have been dragged down while coring.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-24

Date: 10/19/02

Time: 1238

System: Cable vibracore

Station Description:

Northing: 2321097.7

Easting: 2836744.8

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 579.2

Depth to Mudline (ft): 0.5

Penetration (ft): 10.7

Recovery (ft): 7.9

% Recovery: 74

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-24-CS-0-2 (0-2.7')	V. wet, (v. soft), black, clayey, sandy SILT with abundant misc. organics and slight to moderate petroleum sheen and odor.	1	V. wet, (v. soft), black, clayey, sandy SILT with abundant misc. organics and slight to moderate petroleum sheen and odor.	FW-WB-24-CS-0-2 (0-2')	A				
		2							
		3							
FW-WB-24-CS-2-4.2 (2.7-5.7')	Texture change, sand decreasing misc. organics decreasing.	4	Texture change, sand decreasing misc. organics decreasing.	FW-WB-24-CS-2-4.2 (2-4.2')	C				
		5							
		6	Peat zone.	FW-WB-24-CS-4.2-5.6 (4.2-5.6')	C				
		7	Tan sand lense at 4.6 ft below mudline.						
FW-WB-24-CS-4.2-5.6 (5.7-7.6')	Wet, (soft), brown, organic, clayey SILT (OH) with peat zones.	8	Wet, (soft), brown, organic, clayey SILT (OH) with peat zones.	FW-WB-24-CS-5.6-7.9 (5.6-7.9')	A				
		9							
		10							
FW-WB-24-CS-5.6-7.9 (7.6-10.7')	Wet to moist, (soft), dark brown to brown, clayey SILT with fine Sand and scattered shell fragments and organics (ML/OH). (Native?)	11	BOB @ 7.9'						
		12							
		13							
	BOB @ 10.7'								

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-25

Date: 10/25/02

Time: 1310

System: Cable vibracore

Station Description: North side of river.

Northing: 2321500.97

Easting: 2836232.84

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 578.9

Depth to Mudline (ft): 1.0

Penetration (ft): 11.9

Recovery (ft): 11.4

% Recovery: 96

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-25-CS-0-4.4 (0-4.6')	V. wet, (v. soft) black, clayey, sandy SILT with abundant organics; probable coal tar globules; strong petroleum odor. Sandy zone from 3.3 - 3.8 ft below mudline. Thin, gray silt layer at 4.2 ft below mudline.	1	V. wet, (v. soft) black, clayey, sandy SILT with abundant organics; probable coal tar globules; strong petroleum odor. Sandy zone from 3.2 - 3.6 ft below mudline. Thin, gray silt layer at 4 ft below mudline.	FW-WB-25-CS-0-4.4 (0-4.4')	A				
		2							
		3							
		4							
		5							
FW-WB-25-CS-4.4-5.9 (4.6-6.2')	Wet, (soft), dark olive to black clayey SILT with fine to medium Sand; trace shell hash throughout; trace organics. Peat layer at 5.9 ft below mudline.	5	Wet, (soft), dark olive to black clayey SILT with fine to medium Sand; trace shell hash throughout; trace organics.	FW-WB-25-CS-4.4-5.9 (4.4-5.9')	C				
		6	Peat layer at 5.7 ft below mudline.						
FW-WB-25-CS-5.9-7.7 (6.2-8')	Wet, (soft), olive, clayey SILT with fine to medium Sand; trace shell hash; trace organics increasing with depth.	7	Wet, (soft), olive, clayey SILT with fine to medium Sand; trace shell hash; trace organics increasing with depth.	FW-WB-25-CS-5.9-7.7 (5.9-7.7')	A,GT				
		8							
FW-WB-25-CS-7.7-10.1 (8-10.5')	Same as above.	9	Same as above.	FW-WB-25-CS-7.7-10.1 (7.7-10.1')	B,C				
		10							
FW-WB-25-CS-10.1-11.4 (10.5-11.9')	Wet, (loose), olive, silty, fine to medium SAND; some shell hash throughout. (Native?)	11	Wet, (loose), olive, silty, fine to medium SAND; some shell hash throughout. (Native?)	FW-WB-25-CS-10.1-11.4 (10.1-11.4')	A				
		12	BOB @ 11.4'						
	BOB @ 11.9'	13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals

G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners

* In-situ compaction based on linear compaction ratios.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-26a

Date: 10/25/02

Time: 1330

System: Cable vibracore

Station Description: Middle of river.

Northing: 2321473.5

Easting: 2836199.2

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 578.3

Depth to Mudline (ft): 1.6

Penetration (ft): 5.3

Recovery (ft): 5.1

% Recovery: 96

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
		1	V. wet, (v. soft), black, clayey, sandy SILT; extreme odor; extreme staining of CAB liner; coal tar like globules.						
		2							
		3	No Samples Collected from this Core.						
		4							
		5							
		6	BOB @ 5.1'						
		7							
		8							
		9							
		10							
		11							
		12							
		13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals

G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners

* In-situ compaction based on linear compaction ratios.

Core was logged but not sampled due to poor penetration.

CORING NOTES: Refusal at 5.3 ft. Coal tar in core catcher. Large sheen and strong odor.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-26b

Date: 10/25/02

Time: 1406

System: Cable vibracore

Station Description: Middle of river.

Northing: 2321464.6

Easting: 2836209.2

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 578.7

Depth to Mudline (ft): 1.2

Penetration (ft): 11.3

Recovery (ft): 8.9

% Recovery: 79

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-26-CS-0-5 (0-6.5')	V. wet, (v. soft), black, clayey, sandy SILT; moderate petroleum odor; heavy sheen; abundant misc. organics throughout; peaty at top.	1	V. wet, (v. soft), black, clayey, sandy SILT; moderate petroleum odor; heavy sheen; abundant misc. organics throughout; peaty at top.	FW-WB-26-CS-0-5 (0-5')	A				
		2							
		3							
		4							
		5							
		6							
FW-WB-26-CS-5-6.5 (6.5-8.5')	Wet, (soft to v. soft) dark olive to black clayey SILT with fine Sand. (ML) Color change at 8.3 ft below mudline. Sediment becomes lighter and grayer.	7	Wet, (soft) olive, clayey, sandy SILT; trace shell hash increasing with depth; cinder at base of interval. (ML)	FW-WB-26-CS-6.5-7.9 (6.5-7.9')	B,C				
		8	Wet, (loose), olive, silty SAND with trace Clay; some shell hash; mild odor (coal tar). (SM)						
		9	BOB @ 8.9'						
FW-WB-26-CS-6.5-7.9 (8.5-10.3')	Wet, (soft), olive, clayey, sandy SILT; trace shell hash increasing with depth; cinder at base of interval. (ML)	10							
		11							
FW-WB-26-CS-7.9-8.9 (10.3-11.3')	Wet, (loose), olive, silty SAND with trace Clay; some shell hash; mild odor (coal tar). (SM)	12							
	BOB @ 11.3'	13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals

G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners

* In-situ compaction based on linear compaction ratios.

Core catcher covered in NAPL (coal tar).



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-27

Date: 10/25/02

Time: 1435

System: Cable vibracore

Station Description: South side of river.

Northing: 2321435.9

Easting: 2836188.2

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 578.8

Depth to Mudline (ft): 1.1

Penetration (ft): 11.1

Recovery (ft): 9.3

% Recovery: 84

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-27-CS-0-5.4 (0-6.5')	V. wet, (soft), black, clayey SILT with fine Sand; abundant misc. organics; strong petroleum odor; probable coal tar globules (top 3.5'); top 6" brown organic matter.	1	V. wet, (soft), black, clayey SILT with fine Sand; abundant misc. organics; strong petroleum odor; probable coal tar globules (top 3.5'); top 6" brown organic matter.	FW-WB-27-CS-0-5.4 (0-5.4')	C,P				
		2							
		3							
		4							
		5							
		6							
FW-WB-27-CS-5.4-6.9 (6.5-8.3')	Wet, (soft), olive to dark olive, clayey SILT with fine to medium Sand; trace organics.(ML) Color change at 7.8 ft below mudline. Peat layer at 8.3 ft below mudline.	7	Wet, (soft), olive to dark olive, clayey SILT with fine to medium Sand; trace organics. (ML)	FW-WB-27-CS-5.4-6.9 (5.4-6.9')	B,C				
		8	Color change at 6.5 ft below mudline. Peat layer at 6.9 ft below mudline.						
		9	Wet, (soft), olive to brown, clayey SILT with fine to medium Sand; trace shell hash increasing with depth; trace organics. (ML)	FW-WB-27-CS-6.9-8.2 (6.9-8.2')	A,G				
FW-WB-27-CS-6.9-8.2 (8.3-9.8')	Wet, (soft), olive to brown, clayey SILT with fine to medium Sand; trace shell hash increasing with depth; trace organics. (ML)	9	Wet, (loose), olive, silty, SAND with Clay; some shell hash. (SM) (Native?)	FW-WB-27-CS-8.2-9.3 (8.2-9.3')	A				
10		BOB @ 9.3'							
FW-WB-27-CS-8.2-9.3 (9.8-11.1')	Wet, (loose), olive, silty, SAND with Clay; some shell hash. (SM) (Native?)	11							
		12							
		13							
	BOB @ 11.1'								

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-28

Date: 10/25/02

Time: 1610

System: Cable vibracore

Station Description:

Northing: 2321853.3

Easting: 2835704.5

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 578.6

Depth to Mudline (ft): 1.3

Penetration (ft): 10.8

Recovery (ft): 8.9

% Recovery: 82

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay	
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)						
FW-WB-28-CS-0-7 (0-8.4')	V. wet, (v. soft), black, sandy, clayey SILT; moderate to strong odor (different from petroleum or coal tar); abundant organics; peaty throughout.	1	V. wet, (v. soft), black, sandy, clayey SILT; moderate to strong odor (different from petroleum or coal tar); abundant organics; peaty throughout.	FW-WB-28-CS-0-7 (0-7')	B,C,GT P					
	Gravel at 2.6 ft below mudline.	2	Gravel at 2.2 ft below mudline.							
		3								
		4								
		5								
		6								
		7								Tan sand lense with brick and glass from 6.6' to 7.2' below mudline.
	8	Wet, soft, dark olive to brown, clayey, sandy SILT.	FW-WB-28-CS-7-7.6 (7-7.6')							A
FW-WB-28-CS-7-7.6 (8.4-9.1')	Tan sand lense with brick and glass from 7.9' to 8.6' below mudline.	9	Wet, (loose), dark olive, silty SAND with Clay; probable coal tar odor; chunk of wood in core catcher.	FW-WB-28-CS-7.6-8 (7.6-8')	C					
FW-WB-28-CS-7.6-8 (9.1-9.6')	Wet, soft, dark olive to brown, clayey, sandy SILT.	BOB @ 8.9'		FW-WB-28-CS-8-8.9 (8-8.9')						
FW-WB-28-CS-8-8.9 (9.6-10.8')	10									Wet, (loose), dark olive, silty SAND with Clay; probable coal tar odor; chunk of wood in core catcher.
	11									
	12									
	13									

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.
 Probable coal tar stain on core catcher.

CORING NOTES: Sheen created by coring. Coal tar odor observed.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-29

Date: 10/25/02

Time: 1700

System: Cable vibracore

Station Description: Center of river.

Northing: 2321829.4

Easting: 2835697.6

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 577.9

Depth to Mudline (ft): 2.0

Penetration (ft): 10.5

Recovery (ft): 8.8

% Recovery: 84

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-29-CS-0-5 (0-6')	V. wet, (v. soft), clayey, sandy SILT with abundant misc. organics; finer at base of layer; olive at base of layer; abundant sheen; probable coal tar globules. Worms at 1.1 ft below mudline.	1	V. wet, (v. soft), clayey, sandy SILT with abundant misc. organics; finer at base of layer; olive at base of layer; abundant sheen; probable coal tar globules. Worms at 0.9 ft below mudline.	FW-WB-29-CS-0-5 (0-5')	A				
		2							
		3	Sandy zone; extreme NAPL; trace SLAG.						
	Sandy zone; extreme NAPL; trace SLAG.	4	Same as 0 to 2.2 ft below mudline.						
	Same as 0 to 2.2 ft below mudline.	5	Peat at 3.4 ft below mudline. Peat at 3.7 ft below mudline.	FW-WB-29-CS-5-6.6 (5-6.6')	C				
	Peat at 4 ft below mudline. Peat at 4.4 ft below mudline.	6	Color change at 4.6 ft below mudline; black to dark olive .						
FW-WB-29-CS-5-6.6 (6-7.9')	Wet, (soft), dark olive, clayey SILT with fine to medium Sand; trace SLAG. (ML)	7	Wet, (soft), dark olive, clayey SILT with fine to medium Sand; trace SLAG. (ML)	FW-WB-29-CS-6.6-8.8 (6.6-8.8')	B,C,GT				
		8	Wet, (loose), silty SAND with Clay. (SM) Shell hash from 6.6 ft to 6.8 ft below mudline. Shell hash from 7.6 ft to 7.9 ft below mudline. NAPL at 7.9 ft below mudline.						
FW-WB-29-CS-6.6-8.8 (7.9-10.5')	Shell hash from 7.9 ft to 8.1 ft below mudline.	9	BOB @ 8.8'						
	Wet, (loose), silty SAND with Clay. (SM)	10							
	Shell hash from 9.0 ft to 9.4 ft below mudline. NAPL at 9.4 ft below mudline.	11							
	BOB @ 10.5'	12							
		13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density
P = PCB Congeners
 * In-situ compaction based on linear compaction ratios.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-29geo

Date: 10/25/02

Time: 1710

System: Cable vibracore

Station Description: Center of river.

Northing: 2321829.4

Easting: 2835697.6

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 577.9

Depth to Mudline (ft): 2.0

Penetration (ft): 10.9

Recovery (ft): 8.4

% Recovery: 77

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
		1							
		2							
		3							
		4							
		5							
		6	Wet, (soft), dark olive, clayey SILT with fine to medium Sand; NAPL present.	WB-29 5-6.4 (5-6.4')	UU,CO				
		7	Headspace ranged from 0.0' to 0.005'.						
WB-29 5-6.4 (6.5-8.3')	Wet, (soft), dark olive, clayey SILT with fine to medium Sand; NAPL present.	8	Wet, (loose), silty SAND with Clay; some shell hash; NAPL present. (SM)	WB-29 6.6-7.6 (6.6-7.6')	DS				
	Headspace ranged from 0.0' to 0.005'.	9	Headspace ranged from 0.01' to 0.004'.						
		10	BOB @ 8.4'						
WB-29 6.6-7.6 (8.6-9.9')	Wet, (loose), silty SAND with Clay; some shell hash; NAPL present. (SM)	11							
	Headspace ranged from 0.01' to 0.004'.	12							
	BOB @ 10.9'	13							

NOTES: DS = Direct Shear Testing; UU = UU Triaxial Shear Testing; CO = Consolidation Testing.

* In-situ compaction based on linear compaction ratios.

Headspace measurements taken in tenths of a foot from the top of the sediment to the top of the aluminum pipe.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-30

Date: 10/25/02

Time: 1745

System: Cable vibracore

Station Description: South side of river.

Northing: 2321816.9

Easting: 2835690.26

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 578.4

Depth to Mudline (ft): 1.5

Penetration (ft): 10.4

Recovery (ft): 8.9

% Recovery: 86

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-30-CS-0-1.2 (0-1.4')	V. wet, (v. soft), black, clayey, sandy SILT; abundant misc. organics; sheen; strong odor.	1	V. wet, (v. soft), black, clayey, sandy SILT; abundant misc. organics; sheen; strong odor.	FW-WB-30-CS-0-1.2 (0-1.2')	A				
FW-WB-30-CS-1.2-2.7 (1.4-3.2')	Wet, (loose), tan, silty SAND with black striations throughout.	2	Wet, (loose), tan, silty SAND with black striations throughout.	FW-WB-30-CS-1.2-2.7 (1.2-2.7')	A				
		3	Same as above; heavy NAPL staining from 2.7' to 3.1' below mudline.	FW-WB-30-CS-2.7-3.1 (2.7-3.1')	A				
FW-WB-30-CS-2.7-3.1 (3.2-3.6')	Same as above; heavy NAPL staining from 3.2' to 3.6' below mudline.	4	Wet, (soft), clayey SILT with fine to medium Sand; increasing organics with depth; peaty at bottom; dark gray to dark olive at base of interval. (ML)	FW-WB-30-CS-3.1-4.9 (3.1-4.9')	B,C				
FW-WB-30-CS-3.1-4.9 (3.6-5.7')	Wet, (soft), clayey SILT with fine to medium Sand; increasing organics with depth; peaty at bottom; dark gray to dark olive at base of interval. (ML)	5							
		6	Wet, (soft), dark brown, clayey SILT with fine to medium Sand; abundant organics (peat); trace shell hash. (ML)	FW-WB-30-CS-4.9-5.8 (4.9-5.8')	A				
FW-WB-30-CS-4.9-5.8 (5.7-6.8')	Wet, (soft), dark brown, clayey SILT with fine to medium Sand; abundant organics (peat); trace shell hash. (ML)	7	Wet, (soft), olive, clayey SILT with fine to medium Sand; some organics; trace shell hash. (ML)	FW-WB-30-CS-5.8-6.6 (5.8-6.6')	C,GT,P				
		8	Same as above with NAPL pockets throughout; fining downward.	FW-WB-30-CS-6.6-7.9 (6.6-7.9')	A				
FW-WB-30-CS-6.6-7.9 (7.7-9.2')	Same as above with NAPL pockets throughout; fining downward.	9	Wet, (loose), olive, silty SAND with Clay; some shell hash; NAPL globules throughout. (SM)	FW-WB-30-CS-7.9-8.9 (7.9-8.9')	C				
		10	BOB @ 8.9'						
FW-WB-30-CS-7.9-8.9 (9.2-10.4')	Wet, (loose), olive, silty SAND with Clay; some shell hash; NAPL globules throughout. (SM)	11							
	BOB @ 10.4'	12							
		13							

NOTES: A = Archive; B = Bioassay; C = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals

G = Grain Size; GT = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; P = PCB Congeners

* In-situ compaction based on linear compaction ratios.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-31

Date: 10/19/02

Time: 1035

System: Cable vibracore

Station Description: North side of river.

Northing: 2321097.7

Easting: 2836744.8

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 577.3

Depth to Mudline (ft): 0.5

Penetration (ft): 10.4

Recovery (ft): 9.2

% Recovery: 88

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay	
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)						
FW-WB-31-CS-0-2.8 (0-2.5')	V. wet, (v. soft), black, clayey, sandy SILT with petroleum odor and slight sheen; organic debris.	1	V. wet, (v. soft), black, clayey, sandy SILT with petroleum odor and slight sheen; organic debris.	FW-WB-31-CS-0-2.5 (0-2.5')	A					
	Clay increases at 1.7 ft below mudline.	2	Clay increases at 1.5 ft below mudline.							
		3	Change in consistency.							
	Change in consistency.	4	Wet, (soft), black, clayey SILT with fine Sand and petroleum sheen and odor (ML); a few peat zones with depth.							
FW-WB-31-CS-4-6.5 (4.5-7.3')	Wet, (soft), black, clayey SILT with fine Sand and petroleum sheen and odor (ML); a few peat zones with depth.			5	FW-WB-31-CS-4-6.5 (4-6.5')	B,C				
				6						
				7	Wet to moist, (soft), olive brown, clayey SILT with fine Sand (ML). (Native?)	FW-WB-31-CS-6.5-7.8 (6.5-7.8')	A			
FW-WB-31-CS-6.5-7.8 (7.3-8.8')	Wet to moist, (soft), olive brown, clayey SILT with fine Sand (ML). (Native?)	8	Wet, (loose), tan, silty, fine to medium SAND with moderate shell fragments (SM). (Native)	FW-WB-31-CS-7.8-9.2 (7.8-9.2')	C,G					
		9								
FW-WB-31-CS-7.8-9.2 (8.8-10.4')	Wet, (loose), tan, silty, fine to medium SAND with moderate shell fragments (SM). (Native)	10	BOB @ 9.2'							
	BOB @ 10.4'	11								
		12								
		13								

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals

G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners

* In-situ compaction based on linear compaction ratios.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-32

Date: 10/19/02

Time: 1005

System: Cable vibracore

Station Description:

Northing: 2322277.2

Easting: 2834839.4

Datum: NAD 83 Indiana West

Mudline Elev. (ft):

Depth to Mudline (ft): 0.0

Penetration (ft): 10.8

Recovery (ft): 6.8

% Recovery: 63

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-CS-0-2 (0-3.2')	Wet, (loose), gray to black, silty, fine to medium SAND with woody debris; misc. organics; petroleum sheen (slight) and odor.	1	Wet, (loose), gray to black, silty, fine to medium SAND with woody debris; misc. organics; petroleum sheen (slight) and odor.	FW-WB-CS-0-2 (0-2')	B,C,GT P				
		2							
				3	Wet, (soft), black, clayey SILT with Sand; misc. organics; petroleum sheen and odor. (ML/OH)	FW-WB-CS-2-4 (2-4')	C,GT		
FW-WB-CS-2-4 (3.2-6.4')	Wet, (soft), black, clayey SILT with Sand; misc. organics; petroleum sheen and odor. (ML/OH)	4	Wet, (soft), black, clayey SILT with Sand and extensive NAPL throughout. (ML)	FW-WB-CS-4-6.4 (4-6.4')					
		5							
		6							
					7	Wet, (soft), gray to brown, clayey SILT. (ML)			
FW-WB-CS-4-6.4 (6.4-10.2')	Wet, (soft), black, clayey SILT with Sand and extensive NAPL throughout. (ML)		BOB @ 6.8'						
		8							
		9							
		10							
	Wet, (soft), gray to brown, clayey SILT. (ML)	11							
	BOB @ 10.8'								
		12							
		13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.
 Extent of NAPL appears to be limited to 6.4'.
 Not enough sample in catcher for analysis.
 Decided to accept core even though recovery was poor because of access and NAPL.



CORIN NOTES: No overlying water.

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-33

Date: 10/19/02

Time: 0950

System: cable vibracore

Station Description: South edge of river.

Northing: 2322249.3

Easting: 2834826.4

Datum: NAD 83 Indiana West

Mudline Elev. (ft):

Depth to Mudline (ft): 0.0

Penetration (ft): 11.0

Recovery (ft): 7.7

% Recovery: 70

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-33-CS-0-2 (0-2.9')	V. wet, (v. soft), black, sandy SILT with petroleum sheen and odor; misc. organics.	1	V. wet, (v. soft), black, sandy SILT with petroleum sheen and odor; misc. organics. grading to	FW-WB-33-CS-0-2 (0-2')	A				
		2							
		3		FW-WB-33-CS-2-4 (2-4')	A				
FW-WB-33-CS-2-4 (2.9-5.7')	grading to	4	Wet to moist, (soft), black to brown, sandy, clayey, SILT (ML/OH) with petroleum odor and misc. organics; bands of brown(olive) to black with depth but petroleum odor appears entire.						
		5		FW-WB-33-CS-4-6 (4-6')	C				
		6							
FW-WB-33-CS-4-6 (5.7-8.6')	Wet to moist, (soft), black to brown, sandy, clayey, SILT (ML/OH) with petroleum odor and misc. organics; bands of brown(olive) to black with depth but petroleum odor appears entire.	7	BOB @ 7.7'	FW-WB-33-CS-6-7.4 (6-7.4')	C				
		8							
		9							
FW-WB-33-CS-6-7.4 (8.6-10.6')		10							
		11							
		12							
	Wet, loose, tan to gray, silty, fine to medium SAND (SM) with shell fragments. (Native)	13							

NOTES: A = Archive; B = Bioassay; C = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals

G = Grain Size; GT = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; P = PCB Congeners

* In-situ compaction based on linear compaction ratios.

A lot of compaction but because of access problems and little disturbance, decided to accept core.

Did not reach "clean" material until catcher which appeared to be clean, but did not have enough material to sample.

CORING NOTES: No overlying water at core location.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-34

Date: 10/21/02

Time: 1200

System: Cable vibracore

Station Description: North side of river.

Northing: 2322548.4

Easting: 2834461.3

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 577.4

Depth to Mudline (ft): 0.4

Penetration (ft): 11.0

Recovery (ft): 8.7

% Recovery: 79

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-34-CS-0-1.7 (0-2.2')	V. wet, (v. soft), black, sandy, clayey, SILT with misc. organics (abundant); slight petroleum sheen and moderate odor.	1	V. wet, (v. soft), black, sandy, clayey, SILT with misc. organics (abundant); slight petroleum sheen and moderate odor.	FW-WB-34-CS-0-1.7 (0-1.7')	A				
		2							
FW-WB-34-CS-1.7-4.6 (2.2-6')	V. wet, (soft), dark brown clayey, sandy SILT with misc. organics (more at top) grades to sandy, clayey SILT (ML/OH).	3	V. wet, (soft), dark brown clayey, sandy SILT with misc. organics (more at top) grades to sandy, clayey SILT (ML/OH).	FW-WB-34-CS-1.7-4.6 (1.7-4.6')	B,C,P				
		4							
		5							
		6	Wet, (soft), dark tan, clayey SILT; trace shells (more than below). (ML) (Native?)	FW-WB-34-CS-4.6-6.4 (4.6-6.4')	C,G				
FW-WB-34-CS-4.6-6.4 (6-8.3')	Wet, (soft), dark tan, clayey SILT; trace shells (more than below). (ML) (Native?)	7	Moist, (medium dense), tan, SAND, trace Silt; laminated; trace shells and trace wood (at top and throughout) (SW). (Native)	FW-WB-34-CS-6.4-8.7 (6.4-8.7')	B,C,G				
		8							
		9	BOB @ 8.7'						
FW-WB-34-CS-6.4-8.7 (8.3-11')	Moist, (medium dense), tan, SAND, trace Silt; laminated; trace shells and trace wood (at top and throughout) (SW). (Native)	10							
		11							
		12	BOB @ 11.0'						
		13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-34geo

Date: 10/21/02

Time: 1450

System: Cable vibracore

Station Description: North side of river.

Northing: 2322548.4

Easting: 2834461.3

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 577.4

Depth to Mudline (ft): 0.4

Penetration (ft): 10.9

Recovery (ft): 8.6

% Recovery: 79

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
		1							
		2							
	V. wet, (soft), dark brown clayey, sandy SILT with misc. organics (more at top) grades to sandy, clayey SILT (ML/OH).	3	V. wet, (soft), dark brown clayey, sandy SILT with misc. organics (more at top) grades to sandy, clayey SILT (ML/OH).		UU,CO				
	Geotech sample 2 - 3.5	4	Geotech sample 2 - 3.5						
		5							
		6	Wet, (soft), dark tan, clayey SILT; trace shells (more than below). (Native?)		UU,CO				
		7	Geotech sample 5 - 6.3						
	Wet, (soft), dark tan, clayey SILT; trace shells (more than below). (Native?)	8	Moist, (medium dense), tan, SAND, trace Silt; laminated; trace shells and trace wood (at top and throughout) (SW). (Native)		DS				
	Geotech sample 5 - 6.3	9	Geotech sample 6.3 - 7.9						
	Moist, (medium dense), tan, SAND, trace Silt; laminated; trace shells and trace wood (at top and throughout) (SW). (Native)	10	BOB @ 8.6'						
	Geotech sample 6.3 - 7.9	11							
		12							
	BOB @ 10.9'	13							

NOTES: DS = Direct Shear Testing; UU = UU Triaxial Shear Testing; CO = Consolidation Testing.

* In-situ compaction based on linear compaction ratios.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-35

Date: 10/21/02

Time: 1125

System: Cable vibracore

Station Description: Center of river.

Northing: 2322523.8

Easting: 2834452.8

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 577.6

Depth to Mudline (ft): 0.2

Penetration (ft): 11.3

Recovery (ft): 9.2

% Recovery: 81

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-35-CS-0-1.5 (0-1.8')	V. wet, (loose), black, silty, fine to medium SAND with petroleum sheen and odor; misc. organics.	1	V. wet, (loose), black, silty, fine to medium SAND with petroleum sheen and odor; misc. organics.	FW-WB-35-CS-0-1.5 (0-1.5')	A				
		2							
FW-WB-35-CS-1.5-5 (1.8-6.2')	V. wet to wet, (v. soft), black, clayey SILT with Sand; abundant misc. organics and fibrous organics (OH).	3	V. wet to wet, (v. soft), black, clayey SILT with Sand; abundant misc. organics and fibrous organics (OH).	FW-WB-35-CS-1.5-5 (1.5-5')	B,C				
		4							
		5							
		6							
FW-WB-35-CS-5-7 (6.2-8.6')	Wet to moist, (soft), black to gray to dark olive, clayey SILT with Sand; less sewage related materials (OH).	7	Wet to moist, (soft), black to gray to dark olive, clayey SILT with Sand; less sewage related materials (OH).	FW-WB-35-CS-5-7 (5-7')	C				
		8							
FW-WB-35-CS-7-8.6 (8.6-10.6')	Grading to Olive brown shell fragments (ML). (Native)	9	Wet, loose, gray to olive, sandy, fine to medium Gravel with Silt and shell frags (GM).	FW-WB-35-CS-7-8.6 (7-8.6')	A				
		10							
FW-WB-35-CS-8.6-9.2 (9.2-11.3')	Wet, loose, gray to olive, sandy, fine to medium Gravel with Silt and shell frags (GM).	11	BOB @ 9.2'	FW-WB-35-CS-8.6-9.2 (8.6-9.2')	A				
		12							
		13							
	BOB @ 11.3'								

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-36

Date: 10/21/02

Time: 1100

System: Cable vibracore

Station Description: South side of river.

Northing: 2322497.3

Easting: 2834440.9

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 577.7

Depth to Mudline (ft): 0.1

Penetration (ft): 11.3

Recovery (ft): 9.3

% Recovery: 79

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-36-CS-0-2.2 (0-2.7')	V. wet, (v. soft), black, clayey, sandy SILT with abundant misc. organics; petroleum sheen and slight odor; large gravels in upper 1.5'.	1	V. wet, (v. soft), black, clayey, sandy SILT with abundant misc. organics; petroleum sheen and slight odor; large gravels in upper 1.5'.	FW-WB-36-CS-0-2.2 (0-2.2')	B,C				
		2							
		3							
FW-WB-36-CS-2.2-4.4 (2.7-5.4')	Wet, (v. soft), black, clayey SILT with Sand; less misc. organics.	4	Wet, (v. soft), black, clayey SILT with Sand; less misc. organics.	FW-WB-36-CS-2.2-4.4 (2.2-4.4')	A				
		5							
		6							
FW-WB-36-CS-4.4-5.1 (5.4-6.2')	NAPL pocket in sandy fine to medium gravel matrix.	7	NAPL pocket in sandy fine to medium gravel matrix.	FW-WB-36-CS-4.4-5.1 (4.4-5.1')	A				
	Same as above.	8	Same as above.						
FW-WB-36-CS-5.5-8 (6.7-9.8')	Wet to moist, (soft), olive brown, clayey SILT with fine Sand and abundant to moderate fine organics and trace shell frags (OH).	9	Wet to moist, (soft), olive brown, clayey SILT with fine Sand and abundant to moderate fine organics and trace shell frags (OH).	FW-WB-36-CS-5.5-8 (5.5-8')	C				
		10							
		11							
FW-WB-36-CS-8-8.5 (9.8-10.4')	Wet, (loose), tan to brown, silty, fine to medium SAND (SM). (Native)	12	Wet, (loose), tan to brown, silty, fine to medium SAND (SM). (Native)	FW-WB-36-CS-8-8.5 (8-8.5')	A				
FW-WB-36-CS-8.5-9.1 (10.4-11.1')	Wet, (loose), tan to brown, sandy, fine to medium GRAVEL with Silt (GM). (Native)	13		FW-WB-36-CS-8.5-9.1 (8.5-9.1')	A				
FW-WB-36-CS-9.1-9.3 (11.1-11.3')	Moist to damp, (stiff), gray, silty CLAY (CL).			FW-WB-36-CS-9.1-9.3 (9.1-9.3')	A				
	BOB @ 9.3'								
	BOB @ 11.3'								

NOTES: A = Archive; B = Bioassay; C = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; GT = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; P = PCB Congeners
* In-situ compaction based on linear compaction ratios.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-37

Date: 10/27/02

Time: 1420

System: Cable vibracore

Station Description: North side of river - relocated due to debris and bridge.

Northing: 23223307.9

Easting: 2832863.0

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 577.1

Depth to Mudline (ft): 0.3

Penetration (ft): 11.0

Recovery (ft): 9.7

% Recovery: 88

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-37-CS-0-5 (0-5.7')	V. wet, (v. soft), black, clayey SILT with fine to medium Sand; extremely strong odor (different from petroleum odor); high sheen and probable coal tar globules. Slightly less black and less sheen below 4.2 ft.	1	V. wet, (v. soft), black, clayey SILT with fine to medium Sand; extremely strong odor (different from petroleum odor); high sheen and probable coal tar globules.	FW-WB-37-CS-0-5 (0-5')	C,P				
		2							
		3							
		4							
		5	Slightly less black and less sheen below 3.7 ft.						
FW-WB-37-CS-5-7.8 (5.7-8.8')	Wet, (soft), dark olive, clayey SILT with fine to medium Sand; trace shell hash increases with depth; extremely strong odor as above.	6	Wet, (soft), dark olive, clayey SILT with fine to medium Sand; trace shell hash increases with depth; extremely strong odor as above.	FW-WB-37-CS-5-7.8 (5-7.8')	C,G				
		7							
		8							
FW-WB-37-CS-7.8-9.1 (8.8-10.3')	Wet, (loose to medium dense), dark tan to gray, silty, fine to coarse SAND with trace Clay (SW); some shell hash; coarsening downwards; strong odor as above. (Native)	9	Wet, (loose to medium dense), dark tan to gray, silty, fine to coarse SAND with trace Clay (SW); some shell hash; coarsening downwards; strong odor as above. (Native)	FW-WB-37-CS-7.8-9.1 (7.8-9.1')	C,B				
FW-WB-37-CS-9.1-9.6 (10.3-11')		10	Damp, (firm), tan CLAY with Silt and trace fine Sand (CL) (Native).	FW-WB-37-CS-9.1-9.6 (9.1-9.6')					
	BOB @ 11.0'	11	BOB @ 9.7'		A				
		12							
		13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.

CORING NOTES: Refusal at 11' and large sheen appeared during coring.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-38

Date: 10/24/02

Time: 1500

System: Cable vibracore

Station Description: Center of river.

Northing: 2323294.9

Easting: 2832856.0

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 575.9

Depth to Mudline (ft): 1.5

Penetration (ft): 10.4

Recovery (ft): 9.4

% Recovery: 90

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-38-CS-0-5 (0-5.5')	V. wet, (v. soft), black, sandy, clayey SILT; extremely strong odor (different from petroleum odor); abundant misc. organics throughout; coal tar globules; extreme sheen and oil NAPL. Slightly less black. Peaty at base.	1	V. wet, (v. soft), black, sandy, clayey SILT; extremely strong odor (different from petroleum odor); abundant misc. organics throughout; coal tar globules; extreme sheen and oil NAPL.	FW-WB-38-CS-0-5 (0-5')	A				
		2							
		3							
		4							
		5	Slightly less black. Peaty at base.						
FW-WB-38-CS-5-7.2 (5.5-7.9')	Wet, (soft), dark olive, clayey SILT with fine to medium Sand; trace shell hash; very strong strange odor as above; Slightly more shell hash.	6	Wet, (soft), dark olive, clayey SILT with fine to medium Sand; trace shell hash; very strong strange odor as above;	FW-WB-38-CS-5-7.2 (5-7.2')	A				
		7	Slightly more shell hash.						
		8	Wet, (loose), dark tan, silty SAND with Clay.	FW-WB-38-CS-7.2-8.4 (7.2-8.4')	C,G				
FW-WB-38-CS-7.2-8.4 (7.9-9.2')	Wet, (loose), dark tan, silty SAND with Clay. (SM) (Native)	9	(Native) Moist, (v. firm), tan CLAY with Silt and trace fine Sand (CL) (Native)	FW-WB-38-CS-8.4-9.4 (8.4-9.4')					
FW-WB-38-CS-8.4-9.4 (9.2-10.4')	Moist, (v. firm), tan CLAY with Silt and trace fine Sand (CL) (Native).	10	BOB @ 9.4'						
	BOB @ 10.4'	11							
		12							
		13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.

CORING NOTES: Refusal at 10.4 ft.
 Large sheen created by coring.
 Coal tar on core tube.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-39

Date: 10/24/02

Time: 1550

System: Cable vibracore

Station Description: South side of river.

Northing: 2323271.3

Easting: 2832860.4

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 575.9

Depth to Mudline (ft): 1.5

Penetration (ft): 10.0

Recovery (ft): 8.3

% Recovery: 83

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-39-CS-0-3.1 (0-3.7')	V. wet, (v. soft), black, clayey SILT with fine to medium Sand; strong petroleum odor, high sheen; abundant organics throughout.	1	V. wet, (v. soft), black, clayey SILT with fine to medium Sand; strong petroleum odor, high sheen; abundant organics throughout.	FW-WB-39-CS-0-3.1 (0-3.1')	A				
		2							
		3							
	Dark olive at base.	4	Wet, (soft), dark olive, clayey, sandy SILT (ML); trace shell hash increasing at base; trace organics (peaty).	FW-WB-39-CS-3.1-5.3 (3.1-5.3')	B,C,GT				
FW-WB-39-CS-3.1-5.3 (3.7-6.4')	Wet, (soft), dark olive, clayey, sandy SILT (ML); trace shell hash increasing at base; trace organics (peaty).	5	Peat layer at 4.5 ft below mudline.	FW-WB-39-CS-5.3-7.7 (5.3-7.7') MS/MSD	C				
		6							
	Peat layer at 5.4 ft below mudline.	7	Moist to wet, (loose to dense), tan, silty, SAND with trace Clay (SM); abundant shell hash concentrated in middle. (Native)						
FW-WB-39-CS-5.3-7.7 (6.4-9.2')	Moist to wet, (loose to dense), tan, silty, SAND with trace Clay (SM); abundant shell hash concentrated in middle. (Native)	8	Gravel in sand.	FW-WB-39-CS-7.7-8.3 (7.7-8.3')	A				
		9	Moist, (v. firm), tan, CLAY with trace Silt and fine Sand, trace gravel at top (CL) (Native)						
FW-WB-39-CS-7.7-8.3 (9.2-10')	Gravel in sand.	10	BOB @ 8.3'						
BOB @ 10.0'		11							
		12							
		13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals

G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners

* In-situ compaction based on linear compaction ratios.

MS/MSD collected at FW-WB-39-CS-5.3-7.7.


Lots of fluidized sediment in top of core. Probably better recovery than measured.



CORING NOTES: Refusal at 10'.

FOSTER WHEELER ENVIRONMENTAL CORPORATION

West Branch Grand Calumet River Sediment Investigation October 2002										
SEDIMENT CORE: WB-40			Northing: 2323420.98				Depth to Mudline (ft): 0.9			
Date: 10/24/02			Easting: 2832309.96				Penetration (ft): 10.8			
Time: 1200			Datum: NAD 83 Indiana West				Recovery (ft): 9.5			
System: Cable vibracore			Mudline Elev. (ft): 576.5				% Recovery: 88			
Station Description: North side of river in outfall stream.			Lab Grain Size (%)							
DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay	
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)						
FW-WB-40-CS-0-3 (0-3.4')	V. wet, (v. soft), dark brown to black, clayey SILT with trace fine Sand; strong petroleum odor; high sheen; abundant misc. organics; trace twigs. Coarse sand sized material at 2.5 ft below mudline.	1	V. wet, (v. soft), dark brown to black, clayey SILT with trace fine Sand; strong petroleum odor; high sheen; abundant misc. organics; trace twigs. Coarse sand sized material at 2.2 ft below mudline	FW-WB-40-CS-0-3 (0-3')	B,C					
		2								
		3								
FW-WB-40-CS-3-5.4 (3.4-6.2')	Wet, (soft), dark olive, clayey SILT with fine to medium Sand (ML). Texture change; softer above; peaty below; sandier at base.	4	Wet, (soft), dark olive, clayey SILT with fine to medium Sand (ML). Texture change; softer above; peaty below; sandier at base.	FW-WB-40-CS-3-5.4 (3-5.4')	A					
		5								
		6								
FW-WB-40-CS-5.4-6.9 (6.2-7.9')	Wet, (soft), dark olive clayey, sandy, SILT (ML); trace shell hash; some trace organics; peaty. Snail shells at top of interval.	7	Wet, (soft), dark olive clayey, sandy, SILT (ML); trace shell hash; some trace organics; peaty. Snail shells at top of interval.	FW-WB-40-CS-5.4-6.9 (5.4-6.9') D1	C					
		8								
FW-WB-40-CS-6.9-9.5 (7.9-10.8')	Moist to wet, (loose to dense), dark tan, silty, fine to medium SAND (SM); laminated; trace to some shell hash (increasing with depth) (Native). Wood.	9	Moist to wet, (loose to dense), dark tan, silty, fine to medium SAND (SM); laminated; trace to some shell hash (increasing with depth) (Native). Wood.	FW-WB-40-CS-6.9-9.5 (6.9-9.5') D2	A,G					
		10								
		11								
	BOB @ 10.8'	12	BOB @ 9.5'							
		13								
NOTES: A = Archive; B = Bioassay; C = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals G = Grain Size; GT = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; P = PCB Congeners * In-situ compaction based on linear compaction ratios. D1 = A duplicate was collected for FW-WB-40-CS-5.4-6.9, FW-WB-56-CS-5.4-6.9, and analyzed for chemistry. D2 = A duplicate was collected for FW-WB-40-CS-6.9-9.5, FW-WB-62-CS-6.9-9.5, and was analyzed for grain size.										
CORING NOTES: Refusal at 10.8'.										



FOSTER WHEELER ENVIRONMENTAL CORPORATION



**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-41

Date: 10/24/02

Time: 1235

System: Cable vibracore

Station Description: Center of river south of Calumet Flat outfall.

Northing: 2323378.3

Easting: 2832301.8

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 575.9

Depth to Mudline (ft): 1.5

Penetration (ft): 9.4

Recovery (ft): 8.1

% Recovery: 86

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-41-CS-0-0.8 (0-0.9')	V. wet, (v. soft to firm), black, clayey, sandy SILT; strong peat odor; sheen; abundant misc. organics throughout; twigs.	1	V. wet, (v. soft to firm), black, clayey, sandy SILT; strong peat odor; sheen; abundant misc. organics throughout; twigs.	FW-WB-41-CS-0-0.8 (0-0.8')	A				
FW-WB-41-CS-0.8-4.7 (0.9-5.5')	V. wet, (v. soft), black, clayey SILT with fine Sand; strong petroleum odor; sheen; abundant misc. organics increasing with depth; probable coal tar globules present (small).	2	V. wet, (v. soft), black, clayey SILT with fine Sand; strong petroleum odor; sheen; abundant misc. organics increasing with depth; probable coal tar globules present (small).	FW-WB-41-CS-0.8-4.7 (0.8-4.7')	C				
		3							
		4							
		5	Sandy zone with increased fibrous organics (peaty); coal at base of interval.						
	Sandy zone with increased fibrous organics (peaty); coal at base of interval.	6							
FW-WB-41-CS-4.7-6.1 (5.5-7.1')	Wet, (v. soft), olive, clayey, SILT with fine Sand (ML); trace shell hash. Dark band at 6.4 ft below mudline.	7	Wet, (v. soft), olive, clayey, SILT with fine Sand (ML); trace shell hash. Dark band at 5.5 ft below mudline.	FW-WB-41-CS-4.7-6.1 (4.7-6.1')	A,GT				
FW-WB-41-CS-6.1-8.1 (7.1-9.4')	Wet, (loose), olive to dark tan, silty, fine to medium SAND with Clay (SM) (siltier at top, sandier at base); some shell hash increasing with depth; trace twigs. (Native)	8	Wet, (loose), olive to dark tan, silty, fine to medium SAND with Clay (SM) (siltier at top, sandier at base); some shell hash increasing with depth; trace twigs. (Native)	FW-WB-41-CS-6.1-8.1 (6.1-8.1')	B,C				
		9	BOB @ 8.1'						
		10							
	BOB @ 9.4'	11							
		12							
		13							

NOTES: A = Archive; B = Bioassay; C = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; GT = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; P = PCB Congeners
* In-situ compaction based on linear compaction ratios.

CORING NOTES: Refusal at 9.4'.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-42

Date: 10/24/02

Time: 1300

System: Cable vibracore

Station Description: South side of river across from Calumet Flexicore.

Northing: 2323355.2

Easting: 2832291.0

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 577.2

Depth to Mudline (ft): 0.2

Penetration (ft): 11.7

Recovery (ft): 10.2

% Recovery: 87

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-42-CS-0-1.5 (0-1.7')	V. wet, (v. soft), black, clayey SILT, with fine to medium Sand; strong petroleum odor; sheen; abundant organics throughout.	1	V. wet, (v. soft), black, clayey SILT, with fine to medium Sand; strong petroleum odor; sheen; abundant organics throughout.	FW-WB-42-CS-0-1.5 (0-1.5')	A				
FW-WB-42-CS-1.5-6 (1.7-6.9')	V. wet, (v. soft to soft), clayey SILT with fine to medium Sand; less sand and and misc. organics than above; strong petroleum odor; sheen; some misc. organics.	2	V. wet, (v. soft to soft), clayey SILT with fine to medium Sand; less sand and and misc. organics than above; strong petroleum odor; sheen; some misc. organics.	FW-WB-42-CS-1.5-6 (1.5-6')	B,C,GT P				
		3							
		4							
		5							
		6							
		7	Wet, (soft), dark brown to black sandy SILT with Clay; abundant plant material - peaty (OH).	FW-WB-42-CS-6-7.7 (6-7.7')	A				
FW-WB-42-CS-6-7.7 (6.9-8.9')	Wet, (soft), dark brown to black sandy SILT with Clay; abundant plant material - peaty (OH).	8		FW-WB-42-CS-7.7-8.6 (7.7-8.6')	C				
		9	Wet, (soft), dark olive SILT with fine to medium Sand and Clay (ML).						
FW-WB-42-CS-7.7-8.6 (8.9-9.9')	Wet, (soft), dark olive SILT with fine to medium Sand and Clay (ML).	10	Wet, loose, dark tan to olive, silty SAND with Clay (SM) (Native)	FW-WB-42-CS-8.6-10 (8.6-10')	A				
FW-WB-42-CS-8.6-10 (9.9-11.5')	Wet, loose, dark tan to olive, silty SAND with Clay (SM) (Native)	11	Soft, olive, sandy, clayey SILT with shell hash.						
	Soft, olive, sandy, clayey SILT with shell hash.		BOB @ 10.2'						
	BOB @ 11.7'	12							
		13							

NOTES: A = Archive; B = Bioassay; C = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; GT = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; P = PCB Congeners
* In-situ compaction based on linear compaction ratios.

CORING NOTES: Sheen created from coring.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-43

Date: 10/16/02

Time: 1600

System: Cable vibracore

Station Description:

Northing: 2319219.8

Easting: 2843900.8

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 577.0

Depth to Mudline (ft): 1.2

Penetration (ft): 11.5

Recovery (ft): 9.9

% Recovery: 86

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-43-CS-0-2 (0-2.3')	V. wet, (v. soft), black, clayey, sandy SILT with lenses of organics throughout; extensive petroleum sheen and odor; woody debris on top of core.	1	V. wet, (v. soft), black, clayey, sandy SILT with lenses of organics throughout; extensive petroleum sheen and odor; woody debris on top of core.	FW-WB-43-CS-0-2 (0-2')	B,C,P				
		2							
FW-WB-43-CS-2-5 (2.3-5.8')	V. wet, (v. soft), black to brown, clayey SILT with fine Sand; petroleum sheen and odor decreases with depth, but is still there; human hair observed; clay increasing with depth; sand decreasing with depth. Zone of coal tar. Zone of coal tar.	3	V. wet, (v. soft), black to brown, clayey SILT with fine Sand; petroleum sheen and odor decreases with depth, but is still there; human hair observed; clay increasing with depth; sand decreasing with depth.	FW-WB-43-CS-2-5 (2-5')	A				
		4	Zone of coal tar.						
		5	Zone of coal tar.						
		6							
FW-WB-43-CS-5-7.7 (5.8-8.9')		7	Zone of coal tar type material.	FW-WB-43-CS-5-7.7 (5-7.7')	A				
		8	Zone of coal tar type material. Peat zone 1-2"						
		9	Wet, (soft), olive brown, clayey SILT with fine Sand and fine organics (fibers) (OH). (Native?)	FW-WB-43-CS-7.7-9.9 (7.7-9.9')	B,C				
FW-WB-43-CS-7.7-9.9 (8.9-11.5')	Wet, (soft), olive brown, clayey SILT with fine Sand and fine organics (fibers) (OH). (Native?)	10							
		11	BOB @ 9.9'						
		12							
	BOB @ 11.5'	13							

NOTES: A = Archive; B = Bioassay; C = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; GT = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; P = PCB Congeners
* In-situ compaction based on linear compaction ratios.

CORING NOTES: Petroleum sheen created from coring - petroleum odor.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-44

Date: 10/16/02

Time: 1635

System: Cable vibracore

Station Description:

Northing: 2319193.8

Easting: 2843879.2

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 576.5

Depth to Mudline (ft): 1.7

Penetration (ft): 11

Recovery (ft): 9.2

% Recovery: 84

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-44-CS-0-1.2 (0-1.4')	V. wet, (v. soft), black, sandy, clayey SILT with fine organics throughout; petroleum sheen and odor (extensive).	1	V. wet, (v. soft), black, sandy, clayey SILT with fine organics throughout; petroleum sheen and odor (extensive).	FW-WB-44-CS-0-1.2 (0-1.2')	A				
	grading to V. wet, (v. soft), black-brown, clayey SILT with fine Sand and petroleum sheen and odor; more like an oil product.	2	grading to V. wet, (v. soft), black-brown, clayey SILT with fine Sand and petroleum sheen and odor; more like an oil product.						
FW-WB-44-CS-2-4 (2.4-4.8')		3		FW-WB-44-CS-2-4 (2-4')	C				
		4							
		5	Peat layer; brown, soft (PT).	FW-WB-44-CS-4.4-5.6 (4.4-5.6')	A				
FW-WB-44-CS-4.4-5.6 (5.3-6.7')	Peat layer; brown, soft (PT).	6							
		7	Moist, (soft), brown to olive, clayey SILT with fine Sand and high organic content; scattered shell fragments; no obvious sheen (OH). (Native?)	FW-WB-44-CS-6-8 (6-8')	C				
FW-WB-44-CS-6-8 (7.2-9.6')	Moist, (soft), brown to olive, clayey SILT with fine Sand and high organic content; scattered shell fragments; no obvious sheen (OH). (Native)	8							
		9							
		10	BOB @ 9.2'						
		11							
	BOB @ 11.0'	12							
		13							

NOTES: A = Archive; B = Bioassay; C = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; GT = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; P = PCB Congeners
* In-situ compaction based on linear compaction ratios.

CORING NOTES: Strong petroleum odor; sheen created from coring.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-45

Date: 10/16/02

Time: 1715

System: Cable vibracore

Station Description:

Northing: 2319167.7

Easting: 2843865.7

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 576.9

Depth to Mudline (ft): 1.2

Penetration (ft): 11.4

Recovery (ft): 10.0

% Recovery: 88

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-45-CS-0-2 (0-2.3')	V. wet, (v. soft), sandy, clayey SILT with abundant fine organics throughout; petroleum sheen and odor; some peat material; sheen ends at 1 ft below mudline (OH).	1	V. wet, (v. soft), sandy, clayey SILT with abundant fine organics throughout; petroleum sheen and odor; some peat material; sheen ends at 1 ft below mudline (OH).	FW-WB-45-CS-0-2 (0-2')	A				
		2							
FW-WB-45-CS-2-3.9 (2.3-4.4')	Tan, fine to medium SAND lense with Silt (SW); organics reduce with depth.	3	Tan, fine to medium SAND lense with Silt (SW); organics reduce with depth.	FW-WB-45-CS-2-3.9 (2-3.9')	C,GT				
		4							
FW-WB-45-CS-3.9-6.9 (4.4-7.9')	Same as 0 to 3.6 ft below mudline.	5	Same as 0 to 3.2 ft below mudline.	FW-WB-45-CS-3.9-6.9 (3.9-6.9')	C				
		6	Tan, fine to medium SAND lense with Silt (SW).						
		7	Same as 0 to 3.2 ft below mudline.						
		8	Wet to moist, (loose), tan, silty, fine to medium SAND to fine to medium SAND with Silt (SM/SW) (Native).						
FW-WB-45-CS-6.9-10 (7.9-11.4')	Wet to moist, (loose), tan, silty, fine to medium SAND to fine to medium SAND with Silt (SM/SW) (Native).	9	BOB @ 10'	FW-WB-45-CS-6.9-10 (6.9-10')	A,G				
		10							
		11							
	BOB @ 11.4'	12							
		13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.

CORING NOTES: Petroleum odor and sheen created by coring.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-46

Date: 10/17/02

Time: 1425

System: Cable vibracore

Station Description:

Northing: 2320500.1

Easting: 2839349.9

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 579.0

Depth to Mudline (ft): 0.9

Penetration (ft): 11

Recovery (ft): 9.7

% Recovery: 88

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-46-CS-0-2 (0-2.3')	V. wet, (v. soft), black, clayey SILT with Sand and abundant petroleum sheen and odor.	1	V. wet, (v. soft), black, clayey SILT with Sand and abundant petroleum sheen and odor.	FW-WB-46-CS-0-2 (0-2')	A				
		2							
FW-WB-46-CS-2-5.2 (2.3-5.9')	V. wet to wet, (soft), olive brown, clayey SILT with fine Sand; scattered shell fragments; peaty transition in top of interval (ML) (Native?).	3	V. wet to wet, (soft), olive brown, clayey SILT with fine Sand; scattered shell fragments; peaty transition in top of interval (ML) (Native?).	FW-WB-46-CS-2-5.2 (2-5.2')	C,G				
		4							
		5							
		6							
FW-WB-46-CS-5.2-8 (5.9-9')	Wet, (loose), tan to brown, silty SAND with Clay; scattered shell fragments (SM) (Native).	7	Wet, (loose), tan to brown, silty SAND with Clay; scattered shell fragments (SM) (Native).	FW-WB-46-CS-5.2-8 (5.2-8')	B,C,G				
		8							
		9							
FW-WB-46-CS-8-9.7 (9-11')	Wet, (loose), tan, fine to medium SAND with trace Silt (SW) (Native).	10	Wet, (loose), tan, fine to medium SAND with trace Silt (SW) (Native).	FW-WB-46-CS-8-9.7 (8-9.7')	A				
		11							
		12							
	BOB @ 11.0'	13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.

CORING NOTES: Petroleum sheen created during coring.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-47

Date: 10/17/02

Time: 1540

System: Cable vibracore

Station Description: Center of river.

Northing: 2320460.4

Easting: 2839321.7

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 579.3

Depth to Mudline (ft): 0.6

Penetration (ft): 11.4

Recovery (ft): 10

% Recovery: 88

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-47-CS-0-2.4 D (0-2.8')	V. wet, (v. loose), black, silty fine to medium SAND with abundant petroleum sheen and odor; woody debris; hair; misc. organics.	1	V. wet, (v. loose), black, silty fine to medium SAND with abundant petroleum sheen and odor; woody debris; hair; misc. organics.	FW-WB-47-CS-0-2.4 D (0-2.4')	C,G				
		2							
		3							
FW-WB-47-CS-2.4-5.6 (2.8-6.4')	grading to V. wet, (v. soft to soft), black, sandy, clayey SILT with moderate to abundant petroleum sheen and odor and organics. Tan, fine SAND lense (1").	4	grading to V. wet, (v. soft to soft), black, sandy, clayey SILT with moderate to abundant petroleum sheen and odor and organics. Tan, fine SAND lense (1").	FW-WB-47-CS-2.4-5.6 (2.4-5.6')	A				
		5							
		6							
		7							
FW-WB-47-CS-5.6-8 MS/MSD (6.4-9.2')	Wet to moist, (soft), olive brown to black grading to brown, clayey SILT with fine Sand and scattered organics and shell frags (ML); clay increases with depth. (Native?) Tan, fine SAND lense (1-2") at 7.1 ft below mudline.	8	Wet to moist, (soft), olive brown to black grading to brown, clayey SILT with fine Sand and scattered organics and shell frags (ML); clay increases with depth. (Native?)	FW-WB-47-CS-5.6-8 MS/MSD (5.6-8')	C,G				
		9							
		10							
FW-WB-47-CS-8-10 (9.2-11.4')		11	BOB @ 10.0'	FW-WB-47-CS-8-10 (8-10')	A				
		12							
		13							

NOTES: A = Archive; B = Bioassay; C = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals

G = Grain Size; GT = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; P = PCB Congeners

* In-situ compaction based on linear compaction ratios.

FW-WB-53-CS-0-2.4 is the duplicate of FW-WB-47-CS-0-2.4 and was analyzed for chemistry.

MS/MSD was collected at FW-WB-47-CS-5.6-8.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-48

Date: 10/17/02

Time: 1600

System: Cable vibracore

Station Description:

Northing: 2320420.3

Easting: 2839284.48

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 579.1

Depth to Mudline (ft): 0.8

Penetration (ft): 11.1

Recovery (ft): 9.6

% Recovery: 87

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-48-CS-0-1.8 (0-2.1')	V. wet, (v. soft), black, organic, clayey SILT with Sand and abundant wood/organics; petroleum sheen and odor; 3" wood piece on top. #	1	V. wet, (v. soft), black, organic, clayey SILT with Sand and abundant wood/organics; petroleum sheen and odor; 3" wood piece on top. #	FW-WB-48-CS-0-1.8 (0-1.8')	A				
	Wet, (loose), tan to gray, silty, fine to medium SAND with organics; lense of petroleum here.	2	Wet, (loose), tan to gray, silty, fine to medium SAND with organics; lense of petroleum here.						
FW-WB-48-CS-1.8-4 (2.1-4.6')	Wet to moist, (soft), olive brown, clayey SILT with fine Sand; scattered organics and shell fragments (ML).	3	Wet to moist, (soft), olive brown, clayey SILT with fine Sand; scattered organics and shell fragments (ML) (Native?)	FW-WB-48-CS-1.8-4 (1.8-4')	B,C,P				
	Clay increasing with depth.	4	Clay increasing with depth.						
FW-WB-48-CS-4-6 (4.6-7')	Wet to moist, (soft), olive brown, clayey SILT with fine Sand; scattered organics and shell fragments (ML) (Native?). Clay increasing with depth.	5		FW-WB-48-CS-4-6 (4-6')	C,G				
		6							
		7		FW-WB-48-CS-6-8 (6-8')	A				
FW-WB-48-CS-6-8 (7-9.3')		8		FW-WB-48-CS-8-9.6 (8-9.6')	A				
		9							
FW-WB-48-CS-8-9.6 (9.3-11.1')		10	BOB @ 9.6'						
		11							
		12							
	BOB @ 11.1'	13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals

G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; **P** = PCB Congeners

* In-situ compaction based on linear compaction ratios.

Significant amount of hair, woody debris and petroleum (top 1.1').



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-49

Date: 10/23/02

Time: 1600

System: Cable vibracore

Station Description: North side of river.

Northing: 2323449.6

Easting: 2831962.3

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 577.1

Depth to Mudline (ft): 0.3

Penetration (ft): 11.1

Recovery (ft): 8.6

% Recovery: 77

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-49-CS-0-1 (0-1.3')	V. wet, (v. soft to form), black to green, clayey, sandy SILT; strong petroleum odor and sheen; abundant misc. organics. Hard, gravelly at interface.	1	V. wet, (v. soft to form), black to green, clayey, sandy SILT; strong petroleum odor and sheen; abundant misc. organics. Hard, gravelly at interface.	FW-WB-49-CS-0-1 (0-1')	A				
FW-WB-49-CS-1-1.6 (1.3-2.1')	V. wet, (soft to v. soft), gray clayey SILT; laminated black layers. Hard, gravelly at interface.	2	V. wet, (soft to v. soft), gray clayey SILT; laminated black layers. Hard, gravelly at interface.	FW-WB-49-CS-1-1.6 (1-1.6')	A				
FW-WB-49-CS-1.6-4.5 (2.1-5.8')	V. wet, (soft to v. soft), black, clayey SILT with fine to medium Sand (ML). Increase in misc. organics - peaty from 4.4 to 5.8 ft below mudline.	3	V. wet, (soft to v. soft), black, clayey SILT with fine to medium Sand (ML).	FW-WB-49-CS-1.6-4.5 (1.6-4.5')	B,C,GT P				
		4	Increase in misc. organics - peaty from 3.4 to 4.5 ft below mudline.						
		5	Wet, (soft), olive to dark olive, clayey SILT with fine Sand (ML); trace shell hash throughout.						
		6							
		7	Darker, higher organics from 6.2 to 6.7 ft below mudline. Higher clay content, no shells from 6.7 to 7.1 ft below mudline.						
FW-WB-49-CS-4.5-7.1 (5.8-9.2')	Wet, (soft), olive to dark olive, clayey SILT with fine Sand (ML); trace shell hash throughout. Darker, higher organics from 8 to 8.6 ft below mudline. Higher clay content, no shells from 8.6 to 9.2 ft below mudline.	8	Wet, (loose), dark tan to white, clayey, silty fine to medium SAND with trace Gravel (SM); shell hash throughout. (Native)	FW-WB-49-CS-7.1-7.9 (7.1-7.9')	A				
		9	Moist, (firm), tan, silty CLAY (CL) (clean) (Native).	FW-WB-49-CS-7.9-8.6 (7.9-8.6')	A				
		BOB @ 8.6'							
FW-WB-49-CS-7.1-7.9 (7.1-7.9')	Wet, (loose), dark tan to white, clayey, silty fine to medium SAND with trace Gravel (SM); shell hash throughout. (Native)	10							
FW-WB-49-CS-7.9-8.6 (7.9-8.6')	Moist, (firm), tan, silty CLAY (CL) (clean) (Native).	11							
	BOB @ 11.1'	12							
		13							

NOTES: A = Archive; B = Bioassay; C = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; GT = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; P = PCB Congeners
* In-situ compaction based on linear compaction ratios.
MS/MSD collected at FW-WB-49-CS-4.5-7.1.

CORING NOTES: Hard layer encountered at 1.5' below mudline.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-49geo

Date: 10/24/02

Time: 1640

System: Cable vibracore

Station Description: North side of river.

Northing: 2323449.6

Easting: 2831962.3

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 577.1

Depth to Mudline (ft): 0.3

Penetration (ft): 11

Recovery (ft): 9.1

% Recovery: 83

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
		1							
		2							
		3							
			V. wet, (soft to v. soft), black, clayey SILT with fine Sand.	WB-49 2.8-4.5 (2.8-4.5')	UU,CO				
WB-49 2.8-4.5 (3.4-5.4')	V. wet, (soft to v. soft), black, clayey SILT with fine Sand.	4	Headspace ranged from 0.01' to 0.015'.						
		5							
	Headspace ranged from 0.01' to 0.015'.								
		6	Wet, (soft), olive to dark olive, clayey SILT with fine Sand; trace shell hash (ML).	WB-49 5.2-7.0 (5.2-7.0')	UU,CO				
		7	Wet, (Soft), dark brown, clayey SILT with fine to medium Sand (ML).						
WB-49 5.2-7.0 (6.3-8.5')	Wet, (soft), olive to dark olive, clayey SILT with fine Sand (ML); trace shell hash.		Headspace ranged from 0.0' to 0.003'.						
		8	Wet, (Soft), dark brown, clayey SILT with fine to medium Sand (ML).	WB-49 7.0-8.0 (7.0-8.0')	A				
	Wet, (Soft), dark brown, clayey SILT with fine to medium Sand (ML).								
	Headspace ranged from 0.0' to 0.003'.	9							
WB-49 8.5-9.7 (8.5-9.7')	Wet, (loose), dark tan to white, clayey, silty fine to medium SAND with trace Gravel (SM); shell hash throughout.	10							
		11							
		12							
		13							
	BOB @ 9.1'								

NOTES: A = Archive; UU = UU Triaxial Shear Testing; CO = Consolidation Testing

* In-situ compaction based on linear compaction ratios.

Headspace measurements taken in tenths of a foot from the top of the sediment to the top of the aluminum pipe.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-50

Date: 10/23/02

Time: 1520

System: Cable vibracore

Station Description: Center of river.

Northing: 2323423.9

Easting: 2831967.4

Datum: NAD 83 Indiana West

Mudline Elev. (ft): 576.0

Depth to Mudline (ft): 1.4

Penetration (ft): 8.7

Recovery (ft): 7.8

% Recovery: 90

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-50-CS-0-0.9 (0-1')	V. wet, (v. soft), black, clayey SILT with fine Sand; abundant misc. organics. Oil at 0.4 ft below mudline; Hard dark brown to olive bentonite plug(?) at 0.9 ft below mudline.	1	V. wet, (v. soft), black, clayey SILT with fine Sand; abundant misc. organics. Oil at 0.4 ft below mudline; Hard dark brown to olive bentonite plug(?) at 0.9 ft below mudline.	FW-WB-50-CS-0-0.9 (0-0.9')	A				
FW-WB-50-CS-0.9-2.3 (1-2.6')	V. wet, (v. soft to hard), light gray to black laminated, clayey SILT; fly ash (?) Hard layer, black, laminated, 0.05" to 0.3" thick from 1.3' to 1.5' and 2.1' below mudline.	2	V. wet, (v. soft to hard), light gray to black laminated, clayey SILT; fly ash (?) Hard layer, black, laminated, 0.05" to 0.3" thick from 1.2' to 1.3' and 1.9' below mudline.	FW-WB-50-CS-0.9-2.3 (0.9-2.3')	C				
		3	V. wet, (v. soft to soft), dark olive brown to black, clayey SILT with fine to medium Sand; petroleum odor and sheen; abundant misc. organics.	FW-WB-50-CS-2.3-5 (2.3-5')	A				
FW-WB-50-CS-2.3-5 (2.6-5.6')	4	2.3-4' silty less sand and fibrous organics.							
	5	4-5' more sand; abundant fibrous organics.							
	FW-WB-50-CS-5-7.8 D (5.6-8.7')	6	Wet, (soft), dark olive, clayey SILT with fine to medium Sand (ML/OH); some organics; peaty. Peat at 5.7 ft below mudline.	FW-WB-50-CS-5-7.8 D (5-7.8')	GT				
7		SLAG at 6.4 ft below mudline. Clean silt from 6.4-7.1 ft below mudline. More fine to medium Sand and increased shell hash at 7.1 ft below mudline.							
8		Wet, (loose), silty SAND with trace Clay (SM); abundant shell hash in catcher (Native?).							
		9	BOB @ 7.8'						
		10							
		11							
	12								
	13								
	BOB @ 8.7'								

NOTES: A = Archive; B = Bioassay; C = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals

G = Grain Size; GT = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density; P = PCB Congeners

* In-situ compaction based on linear compaction ratios.

FW-WB-55-CS-5-7.8 is the duplicate of FW-WB-50-CS-5-7.8 and was analyzed for chemistry.

CORING NOTES: Hard layer encountered at approximately 3 ft below mudline during coring.
Refusal at 8.7'.



FOSTER WHEELER ENVIRONMENTAL CORPORATION

**West Branch Grand Calumet River
Sediment Investigation
October 2002**

SEDIMENT CORE: WB-51

Date: 10/23/02

Time: 1115

System: Cable vibracore

Station Description: South side of river at State Line.

Northing: 2323408.5

Easting: 2831971.7

Datum: NAD 83 Indiana West

Mudline Elev. (ft):

Depth to Mudline (ft): 0.0

Penetration (ft): 11

Recovery (ft): 8.1

% Recovery: 74

Lab Grain Size (%)

DESCRIPTION OF SEDIMENT					TESTING	Gravel	Sand	Silt	Clay
Sample No. and Sample Depth (ft)	Visual Sample Description (In-situ)*	Depth (ft)	Visual Sample Description (Compacted)	Sample No. and Sample Depth (ft)					
FW-WB-51-CS-0-1.3 (0-1.8')	V. wet, (soft), brown to black PEAT; stained below 0.2'; moderate to heavy sheen; moderate petroleum odor.	1	V. wet, (soft), brown to black PEAT; stained below 0.2'; moderate to heavy sheen; moderate petroleum odor.	FW-WB-51-CS-0-1.3 (0-1.3')	A				
		2	V. wet, (v. soft), black, clayey SILT with fine to medium Sand; heavy sheen; abundant organics; Sandy zone from 2.1 to 2.6 ft below mudline; oily zone from 2.2 to 2.4 ft below mudline.						
FW-WB-51-CS-1.3-6 (1.8-8.4')	V. wet, (v. soft), black, clayey SILT with fine to medium Sand; heavy sheen; abundant organics; Sandy zone from 2.9 to 3.6 ft below mudline; oily zone from 3.1 to 3.4 ft below mudline.	3		FW-WB-51-CS-1.3-6 (1.3-6')	B,C				
			Fine, clayey SILT - clean.						
		4	Oily from 3.2 to 5 ft below mudline.						
	5	Same as 1.3 to 2.6 ft below mudline.							
	Same as 1.8 to 3.6 ft below mudline.	6		FW-WB-51-CS-6-8.1 (6-8.1')	B,C,G				
			Firmer at base; less oil sheen.						
		7	Wet, (soft), dark brown to olive, clayey, sandy, SILT (ML); sand lense at 6.1 ft below mudline. Peaty zone from 6.3 to 6.7 ft below mudline.						
			8	Increased peaty material at base.					
9			BOB @ 8.1'						
10									
FW-WB-51-CS-6-8.1 (8.4-11')	Wet, (soft), dark brown to olive, clayey, sandy, SILT (ML); sand lense at 8.5 ft below mudline. Peaty zone from 8.8 to 9.4 ft below mudline.	11							
	BOB @ 11.0'	12							
		13							

NOTES: **A** = Archive; **B** = Bioassay; **C** = Chemistry Analysis included PCB Aroclors, Organochlorine Pesticides, Semivolatile Organics, Metals (RCRA + Cu + Zn), oil and grease, Total Organic Carbon, and Acid Volatile Sulfides - Simultaneously Extracted Metals
G = Grain Size; **GT** = Geotechnical testing including Grain Size, Specific Gravity, Moisture Content/Bulk Density **P** = PCB Congeners
 * In-situ compaction based on linear compaction ratios.

CORING NOTES: Core located on Illinois/Indiana state line.



FOSTER WHEELER ENVIRONMENTAL CORPORATION